

EXERCISE 1A

1. Write using Roman numerals.

5	7	9	10	12	27	36	43	48	50
V	VII	IX	X	XII	XXVII	XXXVI	XLIII	XLVIII	L

2. Fill in $>$, $<$ or $=$.

a. XXI $>$ XIX b. XXX $<$ L c. $11 \times 5 =$ LV d. $7 \times 5 >$ XXV

3. Write the predecessor of: 4. Write the place value of the given digits.

- a. 19,999 20,000 a. 36,794 3 30000 7 700 6 6000
 b. 1,08,999 1,09,000 b. 23,481 2 20000 3 3000 4 400
 c. 61,999 62,000 c. 6,43,287 6 600000 8 80 3 3000
 d. 75,499 75,500 d. 8,23,694 8 800000 2 2000 6 600
 e. 4,84,999 4,85,000 e. 25,67,489 2 2000000 5 500000 6 60000

5. Do these sums.

a.
$$\begin{array}{r} \overset{1}{6} \overset{1}{8} \overset{1}{7} \overset{1}{5} \overset{1}{4} \overset{1}{3} \\ + 214198 \\ \hline 901741 \end{array}$$

b.
$$\begin{array}{r} \overset{1}{5} \overset{1}{7} \overset{1}{8} \overset{1}{2} \overset{1}{1} \overset{1}{3} \\ + 234875 \\ \hline 813088 \end{array}$$

c.
$$\begin{array}{r} \overset{10}{4} \overset{11}{8} \overset{12}{1} \overset{13}{2} \overset{14}{2} \overset{15}{3} \\ - 176238 \\ \hline 304997 \end{array}$$

d.
$$\begin{array}{r} \overset{9}{8} \overset{11}{0} \overset{12}{2} \overset{10}{3} \overset{9}{0} \overset{14}{4} \\ - 368476 \\ \hline 433828 \end{array}$$

e.
$$\begin{array}{r} \overset{1}{3} \overset{1}{2} \overset{1}{4} \overset{1}{8} \overset{1}{0} \\ + 43596 \\ + 625016 \\ + 38401 \\ \hline 739493 \end{array}$$

f.
$$\begin{array}{r} \overset{1}{5} \overset{1}{2} \overset{1}{3} \overset{1}{3} \overset{1}{4} \overset{1}{5} \\ + 67389 \\ \hline 590734 \end{array}$$

$$\begin{array}{r} \overset{1}{1} \overset{1}{5} \overset{1}{3} \overset{1}{4} \overset{1}{4} \overset{1}{2} \\ + 34281 \\ \hline 187723 \end{array}$$

$$\begin{array}{r} \overset{8}{5} \overset{10}{9} \overset{10}{0} \overset{10}{7} \overset{10}{3} \overset{10}{4} \\ - 187723 \\ \hline 403011 \end{array}$$

Ans. 403011

Ans. 739493

6. Fill in the missing digits.

a.
$$\begin{array}{r} 2(3)4(5)6 \\ + 13(4)5(2) \\ \hline 36908 \end{array}$$

b.
$$\begin{array}{r} 67(1)2(0) \\ - 2(4)3(1)3 \\ \hline (4)2807 \end{array}$$

c.
$$\begin{array}{r} 3(6)0(9)23 \\ - 2344(4)4 \\ \hline (1)2(6)47(9) \end{array}$$

d.
$$\begin{array}{r} (4)5(2)78(3) \\ + 3(9)3(7)36 \\ \hline 8465(1)9 \end{array}$$

7. Fill in.

a. $43 \times 0 = 0$ b. $85 \times 100 = 8500$ c. $315 \times 40 = 12600$ d. $12 \times 3000 = 36000$

8. a. $306 \div 6 = 51$ b. $360 \div 40 = 9$ c. $6300 \div 900 = 7$ d. $90000 \times 3000 = 270000000$

9. Multiply:

$$\begin{array}{r} 45 \\ \times 12 \\ \hline 90 \\ 450 \\ \hline 540 \end{array}$$

Ans. 540

$$\begin{array}{r} 39 \\ \times 18 \\ \hline 312 \\ 390 \\ \hline 702 \end{array}$$

Ans. 702

$$\begin{array}{r} 163 \\ \times 23 \\ \hline 489 \\ 3260 \\ \hline 3749 \end{array}$$

Ans. 3749

$$\begin{array}{r} 428 \\ \times 34 \\ \hline 1712 \\ 12840 \\ \hline 14552 \end{array}$$

Ans. 14552

$$\begin{array}{r} 5482 \\ \times 521 \\ \hline 5482 \\ 109640 \\ 2741000 \\ \hline 2856122 \end{array}$$

Ans. 2856122

10. Divide

$$\begin{array}{r} 40 \\ 14 \overline{) 562} \\ \underline{-56} \\ 002 \\ \underline{-0} \\ 2 \end{array}$$

Ans.

Q = 40, R = 2

$$\begin{array}{r} 14 \\ 27 \overline{) 378} \\ \underline{-27} \\ 108 \\ \underline{-108} \\ 0 \end{array}$$

Ans.

Q = 14, R = 0

$$\begin{array}{r} 102 \\ 54 \overline{) 5508} \\ \underline{-54} \\ 10 \\ \underline{-0} \\ 108 \\ \underline{-108} \\ 0 \end{array}$$

Ans.

Q = 102, R = 0

$$\begin{array}{r} 308 \\ 143 \overline{) 44044} \\ \underline{-429} \\ 114 \\ \underline{-0} \\ 1144 \\ \underline{-1144} \\ 0 \end{array}$$

Ans.

Q = 308, R = 0

$$\begin{array}{r} 140 \\ 340 \overline{) 47625} \\ \underline{-340} \\ 1362 \\ \underline{-1360} \\ 25 \\ \underline{-0} \\ 25 \end{array}$$

Ans.

Q = 140, R = 25

11. Simplify:

$$\begin{aligned} \text{a. } & 640 \div 80 \times 4 - 4 \text{ of } 20 + 639 - 72 \div 9 \\ & = 640 \div 80 \times 4 - 4 \times 20 + 639 - 72 \div 9 \\ & = 8 \times 4 - 4 \times 20 + 639 - 8 \\ & = 32 - 80 + 639 - 8 \\ & = 32 + 639 - 80 - 8 \\ & = 671 - 88 = 583 \end{aligned}$$

Ans. 583

$$\text{b. } 29 \times 5 - 12 \times 7 - 13 \times 5 + 82 \times 8$$

$$\begin{aligned} & = 145 - 84 - 65 + 656 \\ & = 145 + 656 - 84 - 65 \\ & = 801 - 149 \\ & = 652 \end{aligned}$$

Ans. 652

12. 341 : It is an odd number. So, it is not divisible by 2.

The sum of its digits is $3 + 4 + 1 = 8$, which is not divisible by 3. So 341 is not divisible by 3.

It does not end with 5 or 0. So it is not divisible by 5.

It does not end with 0. So it is not divisible by 10.

94 : It is an even number. So it is divisible by 2.

The sum of its digits is $9 + 4 = 13$, which is not divisible by 3. So 94 is not divisible by 3.

It does not end with 5 or 0. So it is not divisible by 5.

It does not end with 0. So it is not divisible by 10.

960 : It is an even number. So it is divisible by 2.

The sum of its digit is $9 + 6 + 0 = 15$, which is divisible by 3. So 960 is divisible by 3.

It ends in 0. So it is divisible by 5.

It ends in 0. So it is divisible by 10.

1281 : It is an odd number. So it is not divisible by 2.

The sum of its digits is $1 + 2 + 8 + 1 = 12$, which is divisible by 3. So 1281 is divisible by 3.

It does not end with 5 or 0. So it is not divisible by 5.

It does not end with 0. So it is not divisible by 10.

EXERCISE 1B

1. Fill in.

a. 4, 45, 30 b. improper, mixed c. $7, \frac{3}{8}$ d. $\frac{5}{11}, \frac{7}{11}, \frac{9}{11}$

e. $\frac{2}{3} = \frac{12}{18}$, $\frac{7}{8} = \frac{49}{56}$, $\frac{5}{12} = \frac{35}{84}$, $\frac{8}{15} = \frac{40}{75}$,

f. True

2. a. In $11 \div 3$, quotient = 3 and remainder = 2

\therefore Mixed fraction = $3\frac{2}{3}$

In $54 \div 10$, quotient = 5 and remainder = 4

\therefore Mixed fraction = $5\frac{4}{10}$

Ans. $3\frac{2}{3}, 5\frac{4}{10}$

b. $4\frac{2}{7} = \frac{4 \times 7 + 2}{7} = \frac{28 + 2}{7} = \frac{30}{7}$

$7\frac{3}{8} = \frac{7 \times 8 + 3}{8} = \frac{56 + 3}{8} = \frac{59}{8}$

Ans. $\frac{30}{7}, \frac{59}{8}$

c. $\frac{2}{3}$ and $\frac{3}{5}$

LCM of 3 and 5 = 15

$\therefore \frac{2}{3} = \frac{2 \times 5}{3 \times 5} = \frac{10}{15}$ and $\frac{3}{5} = \frac{3 \times 3}{5 \times 5} = \frac{9}{15}$

Ans. $\frac{10}{15}, \frac{9}{15}$

d. $\frac{23}{1000} = 0.023$ and $6\frac{3}{10} = 6 + 0.3 = 6.3$

Ans. 0.023, 6.3

Fill in with $<$, $>$ or $=$.

3. a. $\frac{6}{13} > \frac{6}{17}$ b. $\frac{2}{7} < \frac{5}{7}$ c. $\frac{47}{9} = 5\frac{2}{9}$ d. $6\frac{3}{8} < 6\frac{3}{7}$ e. $4\frac{2}{12} > \frac{42}{12}$

4. a. $.01 > 0.009$ b. $.303 > .033$ c. $0.5 = 0.50$ d. $58.9 < 589$ e. $2.06 > 2.006$

5. a. $\frac{4}{15}, \frac{4}{17}, \frac{4}{9}, \frac{4}{7}, \frac{4}{11}$

Denominators in ascending

order = 7, 9, 11, 15, 17

Fraction in descending

order = $\frac{4}{7}, \frac{4}{9}, \frac{4}{11}, \frac{4}{15}, \frac{4}{17}$

b. $\frac{5}{11}, \frac{7}{11}, \frac{8}{11}, \frac{3}{11}, \frac{10}{11}$

Numerators in descending

order = 10, 8, 7, 5, 3

Fraction in descending

order = $\frac{10}{11}, \frac{8}{11}, \frac{7}{11}, \frac{5}{11}, \frac{3}{11}$

6. a. 2.501, 2.5, 2.05, 2.005, 2.051
 Equivalent decimal numbers :
 2.501, 2.500, 2.050, 2.055, 2.051
 In ascending order :
 2.005, 2.050, 2.051, 2.500, 2.501
 or 2.005, 2.05, 2.051, 2.5, 2.501

- b. 0.101, .110, .102, 1.02, 1.021
 Equivalent decimal numbers :
 0.101, .110, .102, 1.020, 1.021
 In ascending order :
 0.101, .102, .110, 1.020, 1.021
 or 0.101, .102, .110, 1.02, 1.021

7. a. $\frac{4}{9} - \frac{1}{3} = \frac{4 \times 1 - 1 \times 3}{9}$
 $= \frac{4-3}{9} = \frac{1}{9}$

b. $\frac{2}{15} + \frac{7}{15} = \frac{2+7}{15} = \frac{9}{15} = \frac{3}{5}$

c. $\frac{9}{17} - \frac{11}{17} + \frac{8}{17}$
 $= \frac{9-11+8}{17} = \frac{17-11}{17} = \frac{6}{17}$

d.
$$\begin{array}{r} \overset{7}{8} \overset{14}{\cancel{8}} \overset{11}{\cancel{2}} \overset{10}{\cancel{0}} \\ - 7 \ 5 \ . \ 3 \ 7 \\ \hline 9 \ . \ 8 \ 3 \end{array}$$

e.
$$\begin{array}{r} \overset{1}{5} \ 2 \ . \ 2 \ 0 \ 7 \\ + 1 \ 3 \ . \ 3 \ 4 \ 5 \\ \hline 6 \ 5 \ . \ 5 \ 5 \ 2 \end{array}$$

8. a. 12 pens cost = ₹ 480
 1 pen cost = ₹ $\frac{480}{12}$
 7 pen costs = ₹ $\frac{480}{12} \times 7$
 $= ₹ 40 \times 7$
 $= ₹ 280$
 \therefore 7 pens cost is ₹ 280.

- b. Fraction of glass full = $\frac{3}{7}$
 \therefore Fraction of glass empty = $1 - \frac{3}{7}$
 $= \frac{1}{1} - \frac{3}{7}$
 $= \frac{1 \times 7 - 3 \times 1}{7}$
 $= \frac{7-3}{7} = \frac{4}{7}$
 So, fraction of glass empty is $\frac{4}{7}$.

- c. Total flowers in vase = 21
 pink flowers = $\frac{2}{7}$ of 21 = $\frac{2}{7} \times 21 = 2 \times 3 = 6$
 yellow flowers = $\frac{3}{7}$ of 21 = $\frac{3}{7} \times 21 = 3 \times 3 = 9$
 \therefore White flowers = $21 - (6 + 9) = 21 - 15 = 6$
 So, 6 white flowers are in the vase.

EXERCISE 1C

1. a. 1 hour = 60 minutes
 5 h 10 min = 5 h + 10 min
 $= (5 \times 60) \text{ min} + 10 \text{ min}$
 $= 300 \text{ min} + 10 \text{ min}$
 $= 310 \text{ minutes}$
- b. 1 day = 24 hours
 2 days 7 h = 2 days + 7 h
 $= (2 \times 24) \text{ h} + 7 \text{ h}$
 $= 48 \text{ h} + 7 \text{ h}$
 $= 55 \text{ hours}$
- c. 1 month = 30 days
 1 week = 7 days
 3 months 3 weeks = $(3 \times 30) \text{ days} + (3 \times 7) \text{ days}$
 $= 90 \text{ days} + 21 \text{ days}$
 $= 111 \text{ days}$

- d. $500 \div 60 = 8$ and remainder 20
So, 500 seconds = 8 min 20 s
- f. $55 \div 24 = 2$ and remainder 7
So, 55 h = 2 days 7 hours

- e. $105 \div 60 = 1$ and remainder 45
So, 105 min = 1 h 45 min

2. a.
$$\begin{array}{r} \text{cm} \quad \text{mm} \\ 1 \quad \quad \quad \\ 5 \quad 2 \\ + 16 \quad 3 \\ + 24 \quad 1 \\ \hline 45 \quad 6 \end{array}$$

b.
$$\begin{array}{r} \text{m} \quad \text{cm} \\ 1 \quad 1 \quad \quad \\ 63 \quad 20 \\ + 35 \quad 73 \\ + 42 \quad 40 \\ \hline 141 \quad 33 \end{array}$$

c.
$$\begin{array}{r} \text{km} \quad \text{m} \\ 1 \quad \quad \quad 1 \quad \quad \quad \\ 6 \quad 102 \\ + 18 \quad 038 \\ \hline 24 \quad 140 \end{array}$$

d.
$$\begin{array}{r} \text{m} \quad \text{cm} \\ 1 \quad 1 \quad \quad \quad \\ 168 \quad 29 \\ + 23 \quad 04 \\ + 318 \quad 00 \\ \hline 509 \quad 33 \end{array}$$

Ans. 45 cm 6 mm Ans. 141 m 33 cm Ans. 24 km 140 m Ans. 509 m 33 cm

3. a.
$$\begin{array}{r} \text{kg} \quad \text{g} \\ \quad \quad 1 \quad \quad \quad \\ 20 \quad 000 \\ + 80 \quad 275 \\ + \quad \quad 350 \\ \hline 100 \quad 625 \end{array}$$

b.
$$\begin{array}{r} \text{l} \quad \text{ml} \\ 1 \quad 1 \quad \quad 1 \quad \quad \quad \\ 49 \quad 278 \\ + 53 \quad 000 \\ + 100 \quad 325 \\ \hline 202 \quad 603 \end{array}$$

c.
$$\begin{array}{r} \text{kg} \quad \text{g} \\ \quad \quad 3 \quad \quad 1 \quad 1 \quad \quad \\ 8 \quad 500 \\ + \quad 9 \quad 063 \\ + 115 \quad 237 \\ + 48 \quad 000 \\ \hline 180 \quad 800 \end{array}$$

Ans. 100 kg 625 g

Ans. 202 l 603 ml

Ans. 180 kg 800 g

4. a.
$$\begin{array}{r} \text{cm} \quad \text{mm} \\ 6 \quad 8 \\ - 2 \quad 6 \\ \hline 4 \quad 2 \end{array}$$

b.
$$\begin{array}{r} \text{m} \quad \text{cm} \\ \quad \quad 5 \quad 100 \\ \del{6} \del{00} \\ - 5 \quad 65 \\ \hline 0 \quad 35 \end{array}$$

c.
$$\begin{array}{r} \text{km} \quad \text{m} \\ \quad \quad 15 \quad 15 \quad \quad \quad \\ 1 \quad \del{8} \del{8} \quad \quad 1000 \\ 266 \del{000} \\ - 66 \quad 409 \\ \hline 199 \quad 591 \end{array}$$

Ans. 4 cm 2 mm

Ans. 35 cm

Ans. 199 km 591 m

d.
$$\begin{array}{r} \text{kg} \quad \text{g} \\ \quad \quad 7 \quad 10 \\ 28 \quad 580 \\ - 13 \quad 025 \\ \hline 15 \quad 555 \end{array}$$

e.
$$\begin{array}{r} \text{l} \quad \text{ml} \\ 0 \quad 11 \quad 8 \quad 1000 \\ \del{119} \del{000} \\ - 64 \quad 793 \\ \hline 54 \quad 207 \end{array}$$

Ans. 15 kg 555 g

Ans. 54 l 207 ml

5. a.
$$\begin{array}{r} \text{m} \quad \text{cm} \\ 1 \quad 3 \quad 3 \quad \quad \quad \\ 125 \quad 50 \\ \times \quad 7 \\ \hline 878 \quad 50 \end{array}$$

b.
$$\begin{array}{r} \text{cm} \quad \text{mm} \\ \quad \quad 5 \quad 5 \quad \quad \quad \\ 18 \quad 9 \\ \times \quad 6 \\ \hline 113 \quad 4 \end{array}$$

c.
$$\begin{array}{r} \text{l} \quad \text{ml} \\ 1 \quad \quad \quad 2 \quad \quad \quad \\ 73 \quad 034 \\ \times \quad 5 \\ \hline 365 \quad 170 \end{array}$$

Ans. 878 m 50 cm

Ans. 113 cm 4 mm

Ans. 365 l 170 ml

d.
$$\begin{array}{r} \text{km} \quad \text{m} \\ 2 \quad 1 \quad \quad 3 \quad 1 \quad \quad \quad \\ 23 \quad 142 \\ \times \quad 9 \\ \hline 208 \quad 278 \end{array}$$

e.
$$\begin{array}{r} \text{kg} \quad \text{g} \\ 1 \quad \quad 1 \quad 2 \quad 2 \quad \quad \quad \\ 232 \quad 256 \\ \times \quad 4 \\ \hline 929 \quad 024 \end{array}$$

Ans. 208 km 278 m

Ans. 929 kg 24 g

6. a.

	l	ml
	31	
16	496	880
	-48	
	16	↓ ↓ ↓
	-16	↓ ↓ ↓
	00	55
		16
	880	880
	-80	
	80	
	-80	
	0	

Ans. 31 l 55 ml

b.

	kg	g
	40	
12	486	600
	-48	
	6	↓ ↓ ↓
	-0	↓ ↓ ↓
	6	550
		12
	6600	6600
	-60	
	60	
	-60	
	00	
	-0	
	0	

Ans. 40 kg 550 g

c.

	km	m
	9	
9	81	549
	-81	
	0	↓ ↓ ↓
		61
		9
	549	549
	-54	
	09	
	-9	
	0	

Ans. 9 km 61 m

d.

	m	cm
	30	
8	243	28
	-24	
	3	↓ ↓ ↓
	-0	↓ ↓ ↓
	3	41
		8
	328	328
	-32	
	08	
	-8	
	0	

Ans. 30 m 41 cm

e.

	cm	mm
	50	
6	300	6
	-30	
	00	↓
	-0	1
	0	6
		6
	6	6
	-6	
	0	

Ans. 50 cm 1 mm

EXERCISE 1D

1. Fill in.
 - a. quadrilateral b. polygon c. length d. radius e. radius f. chord
2. a. Draw a circle of radius 5 cm. b. Draw a line segment of length 6.3 cm.
 Do yourself Do yourself
3. Find the perimeter and area of a rectangle of sides.
 - a. Perimeter of rectangle = side + side + side + side
 = 3 cm + 7 cm + 3 cm + 7 cm = 20 cm
 Area of rectangle = side × side
 = 3 cm × 7 cm = 21 cm²
 Ans. 20 cm, 21 cm²
 - b. Perimeter of rectangle = side + side + side + side
 = 12 m + 24 m + 12 m + 24 m = 72 m
 Area of rectangle = side × side
 = 12 m × 24 m = 288 m²
 Ans. 72 m, 288 m²

4. Find the perimeter and area of a square of sides.

a. Perimeter of square = $4 \times \text{side}$

$$= 4 \times 8 \text{ mm} = 32 \text{ mm}$$

Area of square = $\text{side} \times \text{side}$

$$= 8 \text{ mm} \times 8 \text{ mm} = 64 \text{ mm}^2$$

Ans. 32 mm, 64 mm²

b. Perimeter of square = $4 \times \text{side}$

$$= 4 \times 15 \text{ cm} = 60 \text{ cm}$$

Area of square = $\text{side} \times \text{side}$

$$= 15 \text{ cm} \times 15 \text{ cm} = 225 \text{ cm}^2$$

Ans. 60 cm, 225 cm²

Chapter 2 Roman Numerals

EXERCISE 2

1. Write using Hindu-Arabic numerals.

XII	XVII	XXVII	XXXIV	XLII	XLIX	XXXI	XLV	XLVI	L
12	17	27	34	42	49	31	45	46	50

LII	LV	LIX	LXII	LXVI	LXIX	LXXII	LXXIV	LXXIX	LXXX
52	55	59	62	66	69	72	74	79	80

LXXXII	LXXXIV	LXXXV	LXXXVII	LXXXIX	XC	XCI	XCIV	XCIV	C
82	84	85	87	89	90	91	94	99	100

2. Write using Roman numerals.

15	18	27	38	26	32	41	45	48
XV	XVIII	XXVII	XXXVIII	XXVI	XXXII	XLI	XLV	XLVIII

51	53	56	59	61	64	68	72	74
LI	LIII	LVI	LIX	LXI	LXIV	LXVIII	LXXII	LXXIV

76	78	80	82	83	85	90	99	100
LXXVI	LXXVIII	LXXX	LXXXII	LXXXIII	LXXXV	XC	XCIX	C

3. Fill in > or <.

a. XLIX > XXXIX

b. LV > LIV

c. XLIV < LXIV

d. XLV < LX

e. LXV > XLV

f. LXXX > XLIX

g. L < C

h. XCIII > LXXX

e. XC < C

4. Fill in $>$ or $<$ or $=$.
- a. LXIV $=$ 64 b. $32 + 16 <$ LVIII c. $110 - 35 <$ LXXXV
d. XCIV $<$ 14×7 e. $280 \div 4 =$ LXX d. $6 \times 8 >$ XLV
5. Write in ascending order.
- a. XLIX, LXVII, LXXXIX, XC, XCII, XCV
b. XXX, XXXVII, XL, LX, LXIX, LXX
6. Write in descending order.
- a. XCVII, LXXXVIII, LXVI, LIX, LIV, XX
b. XCIX, LXI, LIX, XXIX, XXI, XV
7. Write the answer in Roman numerals.
- a. LXXVIII b. XL c. XLIX d. C e. LXXXIX f. LI g. L h. LXIII
i. XV

Chapter 3 Large Numbers

EXERCISE 3A

1. Write in the short form.
- a. 76,543 b. 8,64,241 c. 34,26,428 d. 5,14,86,114 e. 13,20,42,057
2. Write in the expanded form.
- a. $20000 + 8000 + 500 + 20 + 4$
b. $100000 + 60000 + 1000 + 0 + 80 + 7$
c. $3000000 + 800000 + 40000 + 2000 + 300 + 20 + 1$
d. $60000000 + 2000000 + 600000 + 0 + 8000 + 500 + 10 + 2$
3. Write in figures.
- a.

TC	C	TL	L
4	0	TTh	Th

H	T	O
6	2	4

b.

TC	C	TL	L
3	4	1	2

H	T	O
2	6	6
- c.

TC	C	TL	L
8	4	7	6

TTh	Th	H	T	O
5	9	0	0	0

d.

TC	C	TL	L
1	9	8	2

TTh	Th	H	T	O
0	3	1	5	5
4. Write in figures.
- a.

HB	TB	B	HM	TM	M
2	4	3	0	0	0

HTh	TTh	Th	H	T	O
6	0	0	2	2	2

b.

HB	TB	B	HM	TM	M
8	0	7	5	0	0

HTh	TTh	Th	H	T	O
0	0	0	0	0	0
5. Write in words using the Indian system of numeration.
- a. 48732 : Forty-eight thousand seven hundred and thirty-two
b. 50050 : Fifty thousand and fifty
c. 353627 : Three lakh fifty-three thousand six hundred and twenty-seven.

- d. 603215 : Six lakh three thousand two hundred and fifteen
e. 3932000 : Thirty-nine lakh thirty-two thousand
f. 8430347 : Eighty-four lakh thirty thousand three hundred and forty-seven
g. 68346582 : Six crore eighty-three lakh forty-six thousand five hundred and eighty-two
h. 53804000 : Five crore thirty-eight lakh four thousand
i. 362040861 : Thirty-six crore twenty lakh forty thousand eight hundred and sixty-one.
j. 400607080 : Forty crore six lakh seven thousand and eighty
6. Write the number names using the international system of numeration.
- a. 326831 : Three hundred twenty-six thousand eight hundred and thirty-one
b. 601275 : Six hundred one thousand two hundred and seventy-five
c. 6436955 : Six million four hundred thirty-six thousand nine hundred and fifty-five
d. 9075300 : Nine million seventy-five thousand three hundred
e. 47600000 : Forty-seven million six hundred thousand
f. 8430347 : Eight million four hundred thirty thousand three hundred and forty-seven
g. 68346582 : Sixty-eight million three hundred forty-six thousand five hundred and eighty-two
h. 384271014 : Three hundred eighty-four million two hundred seventy-one thousand and fourteen
i. 3060070000 : Three billion sixty million seventy thousand
j. 5164334138 : Five billion one hundred sixty-four million three hundred thirty-four thousand one hundred and thirty-eight
7. Rewrite the numbers with commas separating the periods using first the Indian system and then the international system of numeration.
- a. 623467 : 6,23,467 and 623,467
b. 543468 : 5,43,468 and 543,468
c. 2465704 : 24,65,704 and 2,465,704
d. 4647480 : 46,47,480 and 4,647,480
e. 4074023 : 40,74,023 and 4,074,023
f. 33682792 : 3,36,82,792 and 33,682,792
g. 666666 : 6,66,666 and 666,666
h. 32800623 : 3,28,00,623 and 32,800,623
i. 286237428 : 28,62,37,428 and 286,237,428
j. 650002035 : 65,00,02,035 and 650,002,035

8. Write four consecutive numbers that come after.

- a. 68,586 68,587 68,588 68,589 68,590
 b. 2,38,887 2,38,888 2,38,889 2,38,890 2,38,891
 c. 18,62,388 18,62,389 18,62,390 18,62,391 18,62,392
 d. 55,02,84,000 55,02,84,001 55,02,84,002 55,02,84,003 55,02,84,004

9. Write the predecessor of.

- a. 75,999 **76,000** b. 2,51,999 **2,52,000** c. 4,80,101 **4,80,102**
 d. 71,29,999 **71,30,000** e. 6,35,18,211 **6,35,18,212** f. 22,34,82,078 **22,34,82,079**

10. Write the successor of.

- a. **38,000** 38,001 b. **57,089** 57,090 c. **7,29,999** 7,30,000
 d. **46,52,704** 46,52,705 e. **5,09,99,999** 5,10,00,000 f. **27,00,04,009** 27,00,04,010

EXERCISE 3B

1. Fill in.

- a. lakhs, thousands b. ten lakhs, ten thousands c. crores, lakhs
 d. 5,500000 e. 8,8000000

2. Write the place value of the given digits.

- a. 41,863 **4** 40000 **1** 1000 **8** 800 **3** 3
 b. 3,74,586 **3** 300000 **7** 70000 **4** 4000 **5** 500
 c. 52,31,048 **1** 1000 **5** 5000000 **2** 200000 **3** 30000
 d. 14,32,48,007 **1** 100000000 **4** 40000000 **3** 3000000 **2** 200000

3. Write >, < or =.

- a. 38,476 **>** 38,467 b. 3,34,485 **=** 334485
 c. 32,47,286 **<** 3,24,72,000 d. 7,89,63,453 **<** 78 963 988
 e. 2 00 00 000 **<** 20 00 00 000 f. 8 888 777 **<** 8,88,88,777

4. Write the smallest and the largest numbers.

- | Smallest | Largest |
|------------|--------------|
| a. 672841 | 7685126 |
| b. 99,999 | 4,67,823 |
| c. 22,222 | 22,22,22,222 |
| d. 5263748 | 526374859 |

5. Write in descending order.
- 75,00,000 ; 25,77,889 ; 5,63,409 ; 59,741 ; 25,632
 - 82,567 ; 73,642 ; 72,897 ; 35,227 ; 28,493
 - 780900 ; 649700 ; 643826 ; 642589 ; 439571
 - 2,65,49,000 ; 1,50,45,369 ; 1,45,28,302 ; 1,23,36,408 ; 21,72,603
6. Write in ascending order.
- 71,421 ; 8,16,324 ; 9,75,342 ; 56,64,248 ; 89,10,123
 - 5520 ; 63825 ; 742503 ; 8420369 ; 9316224
 - 612182 ; 1224360 ; 2450071 ; 4816203 ; 91827364
 - 2,18,14,121 ; 3,27,18,396 ; 3,61,22,481 ; 5,15,45,135 ; 9,18,36,643
7. Make the greatest and the smallest numbers using all the given digits.
- | Greater number | Smallest number |
|----------------|-----------------|
| a. 754321 | 123457 |
| b. 7654310 | 1034567 |
| c. 9864200 | 2004689 |
| d. 98765543 | 34556789 |

Chapter 4 Operations with Large Numbers

EXERCISE 4A

1. Add.

<p>a.</p> $\begin{array}{r} 21111 \\ 4270756 \\ + 38607342 \\ + 38426450 \\ \hline 81304548 \end{array}$	<p>b.</p> $\begin{array}{r} 111111 \\ 64171042 \\ + 72529653 \\ + 53368337 \\ \hline 190069032 \end{array}$	<p>c.</p> $\begin{array}{r} 1112111 \\ 44158760 \\ + 223507214 \\ + 150764326 \\ \hline 418430300 \end{array}$
<p>d.</p> $\begin{array}{r} 111111 \\ 52332 \\ + 201547 \\ + 3447410 \\ + 36533228 \\ \hline 40234517 \end{array}$	<p>e.</p> $\begin{array}{r} 1121221 \\ 102810835 \\ + 83634720 \\ + 44527390 \\ + 205160155 \\ \hline 436133100 \end{array}$	<p>f.</p> $\begin{array}{r} 111112 \\ 134706124 \\ + 45040423 \\ + 3532248 \\ + 523598 \\ \hline 183802393 \end{array}$

2. Arrange in columns and add.

<p>a.</p> $\begin{array}{r} 1121 \\ 2038 \\ + 473182 \\ + 6225281 \\ \hline 6700501 \end{array}$	<p>b.</p> $\begin{array}{r} 1211 \\ 5454 \\ + 457639 \\ + 26389405 \\ \hline 26852498 \end{array}$	<p>c.</p> $\begin{array}{r} 11111 \\ 72560814 \\ + 9483526 \\ \hline 82044340 \end{array}$
--	--	---

3. Subtract and check the answer:

<p>a.</p> $\begin{array}{r} 4214616 \\ 5243706 \\ - 461387 \\ \hline 4782319 \end{array}$	<p>checking</p> $\begin{array}{r} 1111 \\ 4782319 \\ + 461387 \\ \hline 5243706 \end{array}$ <p style="text-align: right;">So, answer is correct.</p>
--	---

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 14 & 12 & 9 & 14 & 11 & 12 & \\
 & 1 & 2 & 2 & 2 & 2 & 2 & 10 \\
 2 & 5 & 3 & 0 & 5 & 2 & 3 & 0 \\
 - & 6 & 9 & 0 & 9 & 5 & 4 & 4 \\
 \hline
 1 & 8 & 3 & 9 & 5 & 6 & 8 & 6
 \end{array}
 \end{array}$$

checking

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\
 1 & 8 & 3 & 9 & 5 & 6 & 8 & 6 \\
 + & 6 & 9 & 0 & 9 & 5 & 4 & 4 \\
 \hline
 2 & 5 & 3 & 0 & 5 & 2 & 3 & 0
 \end{array}
 \end{array}$$

So, answer is correct.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 9 & 12 & 14 & 16 & 13 & 11 & \\
 & 3 & 10 & 2 & 2 & 2 & 2 & 10 \\
 4 & 0 & 3 & 8 & 7 & 4 & 2 & 0 \\
 - & 2 & 6 & 6 & 9 & 7 & 6 & 3 & 8 \\
 \hline
 1 & 3 & 6 & 5 & 9 & 7 & 8 & 2
 \end{array}
 \end{array}$$

checking

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\
 1 & 3 & 6 & 5 & 9 & 7 & 8 & 2 \\
 + & 2 & 6 & 6 & 9 & 7 & 6 & 3 & 8 \\
 \hline
 4 & 0 & 3 & 8 & 7 & 4 & 2 & 0
 \end{array}
 \end{array}$$

So, answer is correct.

4. a.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 9 & 10 & 9 & 10 & 9 & 10 & \\
 & 0 & 10 & 10 & 10 & 10 & 10 & 10 \\
 1 & 0 & 1 & 0 & 1 & 0 & 1 & 0 \\
 - & 2 & 6 & 3 & 5 & 8 & 4 & 5 \\
 \hline
 7 & 4 & 6 & 5 & 1 & 6 & 5 &
 \end{array}
 \end{array}$$

b.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 9 & & 9 & & & & \\
 & 1 & 10 & 10 & 0 & 10 & 10 & 15 \\
 2 & 0 & 0 & 1 & 0 & 0 & 5 & \\
 - & 3 & 4 & 0 & 7 & 8 & 9 & \\
 \hline
 1 & 6 & 6 & 0 & 2 & 1 & 6 &
 \end{array}
 \end{array}$$

c.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 9 & 9 & 9 & 9 & 9 & 9 & \\
 & 0 & 10 & 10 & 10 & 10 & 10 & 10 \\
 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 - & 4 & 7 & 0 & 5 & 6 & 8 & 8 \\
 \hline
 5 & 2 & 9 & 4 & 3 & 1 & 2 &
 \end{array}
 \end{array}$$

Fill in the missing digits.

5. a.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 1 & 5 & 4 & 1 & 1 & 3 & & \\
 + & 3 & 5 & 3 & 6 & 3 & & \\
 + & 2 & 4 & 6 & 5 & 5 & 2 & \\
 \hline
 4 & 3 & 6 & 0 & 2 & 8 & &
 \end{array}
 \end{array}$$

b.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 2 & 2 & 6 & 0 & 6 & 6 & 5 & \\
 + & 3 & 7 & 2 & 5 & 5 & 4 & 3 \\
 + & 3 & 0 & 4 & 2 & 9 & 3 & \\
 \hline
 6 & 2 & 9 & 0 & 5 & 0 & 1 &
 \end{array}
 \end{array}$$

c.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 8 & 1 & 6 & 7 & 2 & 8 & 4 & 2 \\
 + & 8 & 4 & 0 & 4 & 3 & 5 & 6 \\
 + & 4 & 7 & 5 & 2 & 2 & 5 & 3 \\
 \hline
 9 & 4 & 8 & 2 & 9 & 4 & 5 & 1
 \end{array}
 \end{array}$$

6. a.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 3 & 5 & 6 & 0 & 8 & 2 & & \\
 - & 2 & 4 & 5 & 5 & 1 & 7 & \\
 \hline
 1 & 1 & 0 & 5 & 6 & 5 & &
 \end{array}
 \end{array}$$

b.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 5 & 3 & 4 & 0 & 5 & 1 & 0 & \\
 - & 2 & 3 & 2 & 6 & 7 & 1 & 4 \\
 \hline
 3 & 0 & 1 & 3 & 7 & 9 & 6 &
 \end{array}
 \end{array}$$

c.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 6 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 - & 3 & 6 & 4 & 4 & 2 & 5 & 1 & 4 \\
 \hline
 2 & 3 & 5 & 5 & 7 & 4 & 8 & 6
 \end{array}
 \end{array}$$

7. Simplify.

a.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 2 & 5 & 0 & 0 & 4 & 1 & 3 & 0 \\
 + & 3 & 1 & 3 & 8 & & & \\
 \hline
 2 & 5 & 0 & 0 & 7 & 2 & 6 & 8
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 14 & 9 & & & & & \\
 & 1 & 2 & 10 & 10 & & & \\
 2 & 5 & 0 & 0 & 7 & 2 & 6 & 8 \\
 - & 5 & 6 & 5 & 4 & 1 & 3 & 8 \\
 \hline
 1 & 9 & 3 & 5 & 3 & 1 & 3 & 0
 \end{array}
 \end{array}$$

Ans. 19353130

b.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 4 & 2 & 6 & 6 & 2 & 4 & & \\
 + & 2 & 5 & 3 & 8 & 8 & 6 & \\
 \hline
 6 & 8 & 0 & 5 & 1 & 0 & &
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 7 & 10 & 4 & 10 & 10 & & \\
 6 & 8 & 0 & 5 & 1 & 0 & & \\
 - & 3 & 0 & 5 & 1 & 6 & 7 & \\
 \hline
 3 & 7 & 5 & 3 & 4 & 3 & &
 \end{array}
 \end{array}$$

Ans. 375343

c.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 8 & 4 & 1 & 2 & 5 & 0 & & \\
 + & 6 & 8 & 9 & 5 & 1 & 0 & \\
 \hline
 1 & 5 & 3 & 0 & 7 & 6 & 0 &
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 1 & & & & & & \\
 1 & 2 & 3 & 6 & 0 & 4 & 5 & \\
 + & 4 & 5 & 7 & 2 & 0 & & \\
 \hline
 1 & 2 & 8 & 1 & 7 & 6 & 5 &
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 12 & 9 & 16 & 15 & & & \\
 & 4 & 2 & 10 & 4 & 8 & 8 & 10 \\
 1 & 5 & 3 & 0 & 7 & 6 & 0 & \\
 - & 1 & 2 & 8 & 1 & 7 & 6 & 5 \\
 \hline
 0 & 2 & 4 & 8 & 9 & 9 & 5 &
 \end{array}
 \end{array}$$

Ans. 248995

d.

$$\begin{array}{r}
 \begin{array}{cccccccc}
 1 & 8 & 4 & 0 & 2 & 0 & 1 & 3 \\
 + & 3 & 8 & 2 & 0 & 4 & & \\
 \hline
 1 & 8 & 4 & 4 & 0 & 2 & 1 & 7
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 1 & 1 & & & & & \\
 6 & 6 & 4 & 1 & 3 & 2 & 5 & \\
 + & 3 & 8 & 2 & 0 & 4 & 7 & \\
 \hline
 7 & 0 & 2 & 3 & 3 & 7 & 2 &
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{cccccccc}
 & 9 & 11 & & & & & \\
 & 3 & 10 & 2 & 1 & 1 & & \\
 1 & 8 & 4 & 4 & 0 & 2 & 1 & 7 \\
 - & 7 & 0 & 2 & 3 & 3 & 7 & 2 \\
 \hline
 1 & 1 & 4 & 1 & 6 & 8 & 4 & 5
 \end{array}
 \end{array}$$

Ans. 11416845

EXERCISE 4B

1. Sum of two numbers = 18,27,225
one number = 2,46,745
other number = 18,27,225 - 2,46,745
= 15,80,480

$$\begin{array}{r} 1827225 \\ - 246745 \\ \hline 1580480 \end{array}$$

∴ the number is 15,80,480.

2. a. 6,00,00,000 - 5,78,000 = 5,94,22,000
∴ 6 crore is 5,94,22,000 more than
five lakh seventy-eight thousand.

$$\begin{array}{r} 60000000 \\ - 578000 \\ \hline 59422000 \end{array}$$

- b. The number = 8000000 - 7962360
= 37640

$$\begin{array}{r} 8000000 \\ - 7962360 \\ \hline 37640 \end{array}$$

∴ the number to be added is 37640.

3. The larger number = 3,25,066 + 98,437
= 4,23,503

$$\begin{array}{r} 325066 \\ + 98437 \\ \hline 423503 \end{array}$$

∴ the larger number is 4,23,503.

4. The smaller number = 50,02,000 - 2,11,265
= 47,90,735

$$\begin{array}{r} 5002000 \\ - 211265 \\ \hline 4790735 \end{array}$$

∴ the smaller number is 47,90,735.

5. Population of city = 1,54,23,840
Males = 79,83,115
Females = 1,54,23,840 - 79,83,115
= 74,40,725

$$\begin{array}{r} 15423840 \\ - 7983115 \\ \hline 7440725 \end{array}$$

∴ 74,40,725 females are there in the city.

6. Costs of land = ₹ 8,53,760
Spend on house = ₹ 15,46,920
Total value = ₹ 8,53,760 + ₹ 15,46,920
= ₹ 24,00,680

$$\begin{array}{r} 853760 \\ + 1546920 \\ \hline 2400680 \end{array}$$

- Sold the house = ₹ 30,00,000
Money gained (profit) = ₹ 30,00,000 - ₹ 24,00,680
= ₹ 5,99,320

$$\begin{array}{r} 3000000 \\ - 2400680 \\ \hline 599320 \end{array}$$

∴ he gained ₹ 5,99,320.

7. Man had money = ₹ 1,00,00,000
Total spend money = ₹ 12,60,750 + ₹ 52,53,600 + ₹ 5,68,440
= ₹ 70,82,790

$$\begin{array}{r} 1260750 \\ + 5253600 \\ + 568440 \\ \hline 7082790 \end{array}$$

$$\begin{aligned} \text{Money left with him} &= ₹ 1,00,00,000 - ₹ 70,82,790 \\ &= ₹ 29,17,210 \end{aligned}$$

∴ ₹ 29,17,210 left with him.

$$\begin{array}{r} 10000000 \\ - 7082790 \\ \hline 2917210 \end{array}$$

8. Male voters = 1,43,34,516
 Female voters = 1,35,87,645
 Total voters = 1,43,34,516 + 1,35,87,645
 = 2,79,22,161

$$\begin{array}{r} 14334516 \\ + 13587645 \\ \hline 27922161 \end{array}$$

- Voters did not cast their vote = 8,65,079
 People cast their vote = 2,79,22,161 - 8,65,079
 = 2,70,57,082

$$\begin{array}{r} 27922161 \\ - 865079 \\ \hline 27057082 \end{array}$$

∴ 2,70,57,082 people cast their vote in the election.

EXERCISE 4C

Multiply

1. a.
$$\begin{array}{r} 78935 \\ \times 86 \\ \hline 473610 \\ 6314800 \\ \hline 6788410 \end{array}$$

b.
$$\begin{array}{r} 32893 \\ \times 975 \\ \hline 164465 \\ 2302510 \\ 29603700 \\ \hline 32070675 \end{array}$$

c.
$$\begin{array}{r} 5983 \\ \times 2769 \\ \hline 53847 \\ 358980 \\ 4188100 \\ 11966000 \\ \hline 16566927 \end{array}$$

2. a.
$$\begin{array}{r} 14574 \\ \times 48 \\ \hline 116592 \\ 582960 \\ \hline 699552 \end{array}$$

b.
$$\begin{array}{r} 70624 \\ \times 72 \\ \hline 141248 \\ 4943680 \\ \hline 5084928 \end{array}$$

c.
$$\begin{array}{r} 263078 \\ \times 55 \\ \hline 1315390 \\ 13153900 \\ \hline 14469290 \end{array}$$

3. a.
$$\begin{array}{r} 6549 \\ \times 345 \\ \hline 32745 \\ 261960 \\ 1964700 \\ \hline 2259405 \end{array}$$

b.
$$\begin{array}{r} 3542 \\ \times 635 \\ \hline 17710 \\ 106260 \\ 2125200 \\ \hline 2249170 \end{array}$$

c.
$$\begin{array}{r} 30431 \\ \times 540 \\ \hline 00000 \\ 1217240 \\ 15215500 \\ \hline 16432740 \end{array}$$

4. a.
$$\begin{array}{r} 2638 \\ \times 1523 \\ \hline 7914 \\ 52760 \\ 1319000 \\ 2638000 \\ \hline 4017674 \end{array}$$

b.
$$\begin{array}{r} 2386 \\ \times 3072 \\ \hline 4772 \\ 167020 \\ 000000 \\ 7158000 \\ \hline 7329792 \end{array}$$

c.
$$\begin{array}{r} 32547 \\ \times 1208 \\ \hline 260376 \\ 000000 \\ 6509400 \\ 32547000 \\ \hline 39316776 \end{array}$$

$$\begin{array}{r}
 5. \quad \text{a.} \quad \begin{array}{r} 3429 \\ \times 1510 \\ \hline 0000 \\ 34290 \\ 1714500 \\ \hline 3429000 \\ 5177790 \end{array} \\
 \text{b.} \quad \begin{array}{r} 3516 \\ \times 2500 \\ \hline 0000 \\ 00000 \\ 1758000 \\ 7032000 \\ \hline 8790000 \end{array} \\
 \text{c.} \quad \begin{array}{r} 468 \\ \times 12000 \\ \hline 0000 \\ 00000 \\ 000000 \\ 9360000 \\ \hline 4680000 \\ 5616000 \end{array}
 \end{array}$$

Divide.

$$\begin{array}{r}
 6. \quad \text{a.} \quad \begin{array}{r} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \hline \text{Quotient} = 78 \\ \text{Remainder} = 0 \end{array} \\
 \text{b.} \quad \begin{array}{r} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \hline \text{Quotient} = 87 \\ \text{Remainder} = 5 \end{array} \\
 \text{c.} \quad \begin{array}{r} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \hline \text{Quotient} = 243 \\ \text{Remainder} = 0 \end{array}
 \end{array}$$

$$\begin{array}{r}
 7. \quad \text{a.} \quad \begin{array}{r} 3237 \\ 86 \overline{)278382} \\ \underline{-258} \\ 203 \\ \underline{-172} \\ 318 \\ \underline{-258} \\ 602 \\ \underline{-602} \\ 0 \end{array} \\
 \text{b.} \quad \begin{array}{r} 61091 \\ 58 \overline{)3543305} \\ \underline{-348} \\ 63 \\ \underline{-58} \\ 530 \\ \underline{-522} \\ 85 \\ \underline{-58} \\ 27 \end{array} \\
 \text{c.} \quad \begin{array}{r} 172413 \\ 58 \overline{)10000000} \\ \underline{-58} \\ 420 \\ \underline{-406} \\ 140 \\ \underline{-116} \\ 240 \\ \underline{-232} \\ 80 \\ \underline{-58} \\ 220 \\ \underline{-174} \\ 46 \end{array}
 \end{array}$$

Q = 3237, R = 0

Q = 61091, R = 27

Q = 172413, R = 46

$$\begin{array}{r}
 8. \quad \text{a.} \quad \begin{array}{r} 11014 \\ 642 \overline{)7071463} \\ \underline{-642} \\ 651 \\ \underline{-642} \\ 946 \\ \underline{-642} \\ 3043 \\ \underline{-2568} \\ 475 \end{array} \\
 \text{b.} \quad \begin{array}{r} 5168 \\ 743 \overline{)3840354} \\ \underline{-3715} \\ 1253 \\ \underline{-743} \\ 5105 \\ \underline{-4458} \\ 6474 \\ \underline{-5944} \\ 530 \end{array} \\
 \text{c.} \quad \begin{array}{r} 21900 \\ 918 \overline{)20104384} \\ \underline{-1836} \\ 1744 \\ \underline{-918} \\ 8263 \\ \underline{-8262} \\ 184 \end{array}
 \end{array}$$

Q = 11014, R = 475

Q = 5168, R = 530

Q = 21900, R = 184

$$\begin{array}{r}
 1187 \\
 9. \text{ a. } 1143 \overline{)1357541} \\
 \underline{-1143} \\
 2145 \\
 \underline{-1143} \\
 10024 \\
 \underline{-9144} \\
 8801 \\
 \underline{-8001} \\
 800
 \end{array}$$

$$Q = 1187, R = 800$$

$$\begin{array}{r}
 29620 \\
 9. \text{ b. } 2115 \overline{)62648003} \\
 \underline{-4230} \\
 20348 \\
 \underline{-19035} \\
 13130 \\
 \underline{-12690} \\
 4400 \\
 \underline{-4230} \\
 1703
 \end{array}$$

$$Q = 29620, R = 1703$$

$$\begin{array}{r}
 16994 \\
 9. \text{ c. } 3155 \overline{)53617826} \\
 \underline{-3155} \\
 22067 \\
 \underline{-18930} \\
 31378 \\
 \underline{-28395} \\
 29832 \\
 \underline{-28395} \\
 14376 \\
 \underline{-12620} \\
 1756
 \end{array}$$

$$Q = 16994, R = 1756$$

$$\begin{array}{r}
 226 \\
 10. \text{ a. } 3200 \overline{)724350} \\
 \underline{-6400} \\
 8435 \\
 \underline{-6400} \\
 20350 \\
 \underline{-19200} \\
 1150
 \end{array}$$

$$Q = 226, R = 1150$$

$$\begin{array}{r}
 1234 \\
 10. \text{ b. } 10000 \overline{)12345678} \\
 \underline{-10000} \\
 23456 \\
 \underline{-20000} \\
 34567 \\
 \underline{-30000} \\
 45678 \\
 \underline{-40000} \\
 5678
 \end{array}$$

$$Q = 1234, R = 5678$$

$$\begin{array}{r}
 7764 \\
 10. \text{ c. } 4000 \overline{)31056827} \\
 \underline{-28000} \\
 30568 \\
 \underline{-28000} \\
 25682 \\
 \underline{-24000} \\
 16827 \\
 \underline{-16000} \\
 827
 \end{array}$$

$$Q = 7764, R = 827$$

EXERCISE 4D

1. 1 hour = 60 minutes

$$\begin{aligned}
 6 \text{ hours} + 40 \text{ minutes} &= (6 \times 60) \text{ minutes} + 40 \text{ minutes} \\
 &= 360 \text{ minutes} + 40 \text{ minutes} = 400 \text{ minutes}
 \end{aligned}$$

$$\text{Shikha typed in 1 minute} = 82 \text{ words}$$

$$\text{Shikha typed in 400 minutes} = 82 \times 400 = 32,800 \text{ words}$$

$$1 \text{ week} = 7 \text{ days}$$

$$4 \text{ weeks} = 7 \times 4 \text{ days} = 28 \text{ days}$$

$$\text{Shikha typed in 1 day} = 32,800 \text{ words}$$

$$\begin{aligned}
 \text{Shikha will type in 28 days} &= (32,800 \times 28) \text{ words} \\
 &= 9,18,400 \text{ words}
 \end{aligned}$$

\therefore Shikha will type 9,18,400 words in 4 weeks.

$$\begin{array}{r}
 82 \\
 \times 400 \\
 \hline
 32800
 \end{array}$$

$$\begin{array}{r}
 32800 \\
 \times 28 \\
 \hline
 262400 \\
 656000 \\
 \hline
 918400
 \end{array}$$

2. \therefore 2016 is a leap year, so February has 29 days.

$$\text{Total days in January and February} = (31 + 29) \text{ days} = 60 \text{ days}$$

$$\text{Milk production in 1 day} = 3875 \text{ litres}$$

$$\begin{aligned}
 \therefore \text{Milk production in 60 days} &= (3875 \times 60) \text{ litres} \\
 &= 2,32,500 \text{ litres}
 \end{aligned}$$

\therefore Milk production in the first two months of the year 2016 is 2,32,500 litres.

$$\begin{array}{r}
 3875 \\
 \times 60 \\
 \hline
 232500
 \end{array}$$

3. Least odd number of 5 - digits = 10001
 Largest number of 3 - digits = 999
 \therefore Product = 10001×999
 $= 99,90,999$
 So, product is 99,90,999.

$$\begin{array}{r} 10001 \\ \times 999 \\ \hline 90009 \\ 900090 \\ 9000900 \\ \hline 9990999 \end{array}$$

4. a. Divisor = 88, quotient = 2470, remainder = 25, dividend = ?
 Dividend = divisor \times quotient + remainder
 $= 88 \times 2470 + 25$
 $= 2,17,360 + 25 = 2,17,385$
 \therefore The number is 2,17,385.

$$\begin{array}{r} 2470 \\ \times 88 \\ \hline 19760 \\ 197600 \\ 217360 \\ + 25 \\ \hline 217385 \end{array}$$

- b. Divisor = 256, quotient = 652, remainder = 0, dividend = ?
 Dividend = divisor \times quotient + remainder
 $= 256 \times 652 + 0$
 $= 1,66,912$
 \therefore The number is 1,66,912.

$$\begin{array}{r} 256 \\ \times 652 \\ \hline 512 \\ 12800 \\ 153600 \\ \hline 166912 \end{array}$$

5. a. In ₹ 86 buy the toy = 1
 In ₹ 1 buy the toy = $\frac{1}{86}$
 In ₹ 3000 buy the toys = $\frac{1}{86} \times 3000 = \frac{3000}{86}$
 $\therefore 3000 \div 86 = 34$ and remainder 76
 \therefore Shopkeeper buy 34 toys with ₹ 76 left.

$$\begin{array}{r} 34 \\ 86 \overline{) 3000} \\ \underline{-258} \\ 420 \\ \underline{-344} \\ 76 \end{array}$$

- b. Price of 1 book = ₹ 364
 \therefore Price of 245 books = ₹ (364×245)
 $= ₹ 89,180$
 So, the price of 245 such books is ₹ 89,180.

$$\begin{array}{r} 364 \\ \times 245 \\ \hline 1820 \\ 14560 \\ 72800 \\ \hline 89180 \end{array}$$

6. a. The greatest four-digit number = 9210
 The smallest three-digit number = 129
 \therefore The quotient = 71 and the remainder = 51

$$\begin{array}{r} 71 \\ 129 \overline{) 9210} \\ \underline{-903} \\ 180 \\ \underline{-129} \\ 51 \end{array}$$

- b. The greatest three-digit number = 952
 The smallest three-digit number = 259
 Product = 952×259
 = 2,46,568
 \therefore The product is 2,46,568.

$$\begin{array}{r} 952 \\ \times 259 \\ \hline 8568 \\ 47600 \\ 190400 \\ \hline 246568 \end{array}$$

7. a. Total litchis = 12,70,224
 Litchis in each box = 144
 Total number of boxes = $12,70,224 \div 144$
 = 8821
 So, 8,821 boxes would be required

$$\begin{array}{r} 8821 \\ 144 \overline{) 1270224} \\ \underline{-1152} \\ 1182 \\ \underline{-1152} \\ 302 \\ \underline{-288} \\ 144 \\ \underline{-144} \\ 0 \end{array}$$

- b. Number of litchis in each box = 144
 Number of boxes were used = 2,125
 Total number of litchis were packed = 2125×144
 = 3,06,000
 So, 3,06,000 litchis were packed.

$$\begin{array}{r} 2125 \\ \times 144 \\ \hline 8500 \\ 85000 \\ 212500 \\ \hline 306000 \end{array}$$

8. Students rolled in school = 2597
 Each student pay fees half-yearly = ₹ 4255
 \therefore Each student pay fees yearly = ₹ 4255×2
 (\because 1 year = 2 half year)
 = ₹ 8510
 Total collection of money = ₹ 8510×2597
 = ₹ 2,21,00,470
 So, ₹ 2,21,00,470 are collected in a year.

$$\begin{array}{r} 4255 \\ \times 2 \\ \hline 8510 \end{array}$$

$$\begin{array}{r} 8510 \\ \times 2597 \\ \hline 59570 \\ 765900 \\ 4255000 \\ 17020000 \\ \hline 22100470 \end{array}$$

9. 60 minutes = 1 hour
 1 minutes = $\frac{1}{60}$ hour
 538020 minutes = $\frac{1}{60} \times 538020$ hours
 = $\frac{538020}{60}$ hours
 = 8967 hours
 \therefore 538020 minutes = 8967 hours

$$\begin{array}{r} 8967 \\ 60 \overline{) 538020} \\ \underline{-480} \\ 580 \\ \underline{-540} \\ 402 \\ \underline{-360} \\ 420 \\ \underline{-420} \\ 0 \end{array}$$

10. The smallest number of 6 digit = 100000

Dividing 100000 by 436 leaves 156 as remainder.

So, a number that is 156 less than 100000 is divisible by 436.

$100000 - 156 = 99844$. But 99844 is a 5-digit number

The next number divisible by 436 = $99844 + 436$

$$= 100280$$

So, the smallest 6-digit divisible by 436 is 1,00,280.

$$\begin{array}{r} 229 \\ 436 \overline{) 100000} \\ \underline{-872} \\ 1280 \\ \underline{-872} \\ 4080 \\ \underline{-3924} \\ 156 \end{array}$$

EXERCISE 4E

Simplify.

- $4785 \times 27776 \div 248$ (Divide)
 $= 4785 \times 112$ (Multiply)
 $= 535920$
 - $869 \times 765120 \div 960$ (Divide)
 $= 869 \times 797$ (Multiply)
 $= 692593$
 - $2430 \div 81 \times 30$ (Divide)
 $= 30 \times 30$ (Multiply)
 $= 900$
- $9000 \div 45$ of $20 + 750 \div 150$ (Operation 'of')
 $= 9000 \div 900 + 750 \div 150$ (Divide)
 $= 10 + 5$ (Add)
 $= 15$
 - $4250 \div 125 - 40800 \div 272 + 36 \times 166$ (Divide)
 $= 34 - 150 + 36 \times 166$ (Multiply)
 $= 34 - 150 + 5976$ (Add)
 $= 6010 - 150$ (Subtract)
 $= 5860$
- $4544 \div (70 - 38)$ (Simplify within the brackets)
 $= 4544 \div 32$ (Divide)
 $= 142$
 - $(72 \times 168) \div 21$ of 16 (Simplify within the brackets)
 $= 12096 \div 21$ of 16 (Operation 'of')
 $= 12096 \div 336$ (Divide)
 $= 36$
 - $(24 + 36) \times 64$ (Simplify within the brackets)
 $= 60 \times 64$ (Multiply)
 $= 3840$
- $75 \times 24 \div 12 = 75 \times (24 \div 12)$
 L.H.S. $75 \times 24 \div 12$ (Divide)
 $= 75 \times 2$ (Multiply)
 $= 150$

$$\begin{aligned} \text{R.H.S. } & 75 \times (24 \div 12) && \text{(Simplify within the brackets)} \\ & = 75 \times 2 && \text{(Multiply)} \\ & = 150 \end{aligned}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

So, the statement is **True**.

b. $(12 \times 9) - 7 = 12 \times (9 - 7)$

$$\begin{aligned} \text{L.H.S. } & (12 \times 9) - 7 && \text{(Simplify within the brackets)} \\ & = 108 - 7 && \text{(Subtract)} \\ & = 101 \end{aligned}$$

$$\begin{aligned} \text{R.H.S. } & 12 \times (9 - 7) && \text{(Simplify within the brackets)} \\ & = 12 \times 2 && \text{(Multiply)} \\ & = 24 \end{aligned}$$

$$\text{L.H.S.} \neq \text{R.H.S.}$$

So, the statement is **False**.

c. $(115 \times 28) \div 7 = 115 \text{ of } (28 \div 7)$

$$\begin{aligned} \text{L.H.S. } & (115 \times 28) \div 7 && \text{(Simplify within the brackets)} \\ & = 3220 \div 7 && \text{(Divide)} \\ & = 460 \end{aligned}$$

$$\begin{aligned} \text{R.H.S. } & 115 \text{ of } (28 \div 7) && \text{(Simplify within the brackets)} \\ & = 115 \text{ of } 4 && \text{(Operation 'of')} \\ & = 460 \end{aligned}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

So, the statement is **True**.

d. $84 \div (7 \times 12) = (84 \div 7) \times 12$

$$\begin{aligned} \text{L.H.S. } & 84 \div (7 \times 12) && \text{(Simplify within the brackets)} \\ & = 84 \div 84 && \text{(Divide)} \\ & = 1 \end{aligned}$$

$$\begin{aligned} \text{R.H.S. } & (84 \div 7) \times 12 && \text{(Simplify within the brackets)} \\ & = 12 \times 12 && \text{(Multiply)} \\ & = 144 \end{aligned}$$

$$\text{L.H.S.} \neq \text{R.H.S.}$$

So, the statement is **False**.

5. a. $\{17 \times (112 - 78)\} \div 289$ (Simplify within the first brackets)
 $= \{17 \times 34\} \div 289$ (Simplify within the second brackets)
 $= 578 \div 289$ (Divide)
 $= 2$

b. $15 \times \{28 - (17 - 12)\}$ (Simplify within the first brackets)
 $= 15 \times \{28 - 5\}$ (Simplify within the second brackets)

$$= 15 \times 23$$

(Multiply)

$$= 345$$

- c. $(700 \div 10) - \{(12 \times 8) \div (34 - 10)\}$ (Simplify within the first brackets)
 $= 70 - \{96 \div 24\}$ (Simplify within the second brackets)
 $= 70 - 4$ (Subtract)
 $= 66$
- d. $61 - \{(35 + 34) \div (46 - 23)\}$ (Simplify within the first brackets)
 $= 61 - \{69 \div 23\}$ (Simplify within the second brackets)
 $= 61 - 3$ (Subtract)
 $= 58$

MENTAL MATHS

1. (a) Write in ascending order.
XXVIII, XXXIII, XLIX, LXX, XCII
(b) Write in descending order.
XCII, LXXXII, LXXII, LXII, XLII, XXII
2. Write the answers in Roman numerals.
a. XC b. XCIX c. LXIV d. LXXXI e. XC f. XLIX

PRACTICE SHEET-1

1. Fill in $>$ or $<$ or $=$.
- a. XLI XCI b. $780 \div 13$ LXXV c. LXII 31×2
d. 4,29,04,521 MMM e. 150,000 1,50,000 f. 72 58 421 7 85 842
2. Write in figures.
a. 9,09,099 b. 52,00,37,514 c. 3,454,621 d. 600,278
3. Write in the expanded form.
a. $600000 + 70000 + 2000 + 300 + 80 + 4$
b. $7000000 + 400000 + 0 + 9000 + 200 + 60 + 9$
c. $60000000 + 5000000 + 300000 + 70000 + 4000 + 300 + 0 + 8$
4. a. Write in ascending order: 1,26,42,614 20,74,397 48,652 4,88,526 3,92,815

48,652	3,92,815	4,88,526	20,74,397	1,26,42,614
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b. Write in descending order: 2,53,917 2,39,48,721 63,352 1,00,741 2,68,000

2,39,48,721	2,68,000	2,53,917	1,00,741	63,352
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5. a. Greatest : 8664320, Smallest : 2034668
b. Greatest : 987521, Smallest : 125789

6. a.
$$\begin{array}{r} 1\ 1\ 1\ 1\ 2 \\ 1236874 \\ + 2650381 \\ + 727550 \\ \hline 4614805 \end{array}$$
 b.
$$\begin{array}{r} 1\ 1\ 1\ 1\ 1\ 1 \\ 4172469 \\ + 6974 \\ + 5154312 \\ \hline 9333755 \end{array}$$
 c.
$$\begin{array}{r} 1\ 1\ 1\ 1\ 1\ 1 \\ 14507543 \\ + 22505857 \\ \hline 37013400 \end{array}$$

7. a.
$$\begin{array}{r} 11\ 12\ 16\ 13\ 11 \\ 4\ 4\ 4\ 4\ 4\ 13 \\ 5237423 \\ - 2238534 \\ \hline 2998889 \end{array}$$
 b.
$$\begin{array}{r} 9\ 10 \\ 1\ 10\ 11 \\ 67582011 \\ - 3570582 \\ \hline 64011429 \end{array}$$
 c.
$$\begin{array}{r} 14\ 9 \\ 3\ 4\ 10\ 8\ 10 \\ 450090 \\ - 97859 \\ \hline 352231 \end{array}$$

8. a.
$$\begin{array}{r} 9309 \\ \times 18 \\ \hline 74472 \\ 93090 \\ \hline 167562 \end{array}$$
 b.
$$\begin{array}{r} 25871 \\ \times 123 \\ \hline 77613 \\ 517420 \\ 2587100 \\ \hline 3182133 \end{array}$$
 c.
$$\begin{array}{r} 595352 \\ \times 512 \\ \hline 1190704 \\ 5953520 \\ 297676000 \\ \hline 304820224 \end{array}$$
 b.
$$\begin{array}{r} 23410 \\ \times 2034 \\ \hline 93640 \\ 702300 \\ 0000000 \\ 46820000 \\ \hline 47615940 \end{array}$$

9. a.
$$\begin{array}{r} 1425 \\ 65 \overline{)92677} \\ \underline{-65} \\ 276 \\ \underline{-260} \\ 167 \\ \underline{-130} \\ 377 \\ \underline{-325} \\ 52 \end{array}$$
 b.
$$\begin{array}{r} 654 \\ 132 \overline{)86328} \\ \underline{-792} \\ 712 \\ \underline{-660} \\ 528 \\ \underline{-528} \\ 0 \end{array}$$
 c.
$$\begin{array}{r} 4986 \\ 435 \overline{)2168919} \\ \underline{-1740} \\ 4289 \\ \underline{-3915} \\ 3741 \\ \underline{-3480} \\ 2619 \\ \underline{-2610} \\ 9 \end{array}$$
 d.
$$\begin{array}{r} 1024 \\ 2368 \overline{)2424832} \\ \underline{-2368} \\ 5683 \\ \underline{-4736} \\ 9472 \\ \underline{-9472} \\ 0 \end{array}$$

Q = 1425, R = 52 Q = 654, R = 0 Q = 4986, R = 9 Q = 1024, R = 0

10. a. $(36 \times 160) \div 72$ of 5 = $5760 \div 72$ of 5 = $5760 \div 360$ = 16
 b. $7823 - 128 \div 16$ of 4 - 3973 = $7823 - 128 \div 64 - 3973$ = $7823 - 2 - 3973$ = $7823 - 3975$ = 3848
 c. $89 - \{(25 \times 39) \div (85 - 70)\}$ = $89 - \{975 \div 15\}$ = $89 - 65$ = 24

Chapter 5 Multiples and Factors

EXERCISE 5A

1. Fill in the blanks.

- a. 2, 3, 5, 6, 10, 15 b. 10, 20 c. factors d. divisible

2.

55	10	15	20
99	96	93	90
104	117	130	143
110	121	132	143

3. Tick the multiples of the coloured numbers.

a. 4 16 47 64 98 112 b. 3 46 81 38 99 108 c. 6 25 60 72 96 130

4. a. Multiples of 3: 3 6 9 12 15 18 21 24 27 30 33 36 39 42 45
Multiples of 7: 7 14 21 28 33 42 49

So, 21 and 42 are the first two common multiples of 3 and 7.

b. Multiples of 2: 2 4 6 8 10 12 14 16 18 20 22 24 26

Multiples of 3: 3 6 9 12 15 18 21 24 27

Multiples of 4: 4 8 12 16 20 24 28

So, 12 and 24 are the first two common multiples of 2, 3 and 4.

5. a. Multiples of 5: 5 10 15 20 25 30 35 40 45 50 55
 60 65 70 75 80 85 90

Multiples of 6: 6 12 18 24 30 36 42 48 54 60 66
72 78 84 90

So, 30, 60 and 90 are the first three common multiples of 5 and 6.

b. Multiples of 4: 4 8 12 16 20 24 28 32 36 40 44 48
52 56 60 64 68 72

Multiples of 6: 6 12 18 24 30 36 42 48 54 60 66 72

Multiples of 8: 8 16 24 32 40 48 56 64 72

So, 24, 48 and 72 are the first three common multiples of 4, 6 and 8.

6. In each of the following, is the first number a factor of the second number?

a. 7 78 No b. 8 125 No c. 12 168 Yes d. 16 402 No e. 18 643 No

7. a. Tick the factors of 24 among the following:

2 3 4 5 6 8 10 12 16

b. Tick the factors of 96 among the following:

2 3 4 6 8 9 12 14 16

8. Write three factors of the following numbers, other than 1 and the number itself.

a. 42 → 2, 3, 6 b. 90 → 2, 3, 5 c. 140 → 2, 4, 5 d. 175 → 5, 7, 25

9. Factors of 32 : 2, 4, 8, 16

Factors of 56 : 2, 4, 7, 8, 14, 28

10. a. 1000, 1002, 1004, 1006

b. 90, 92, 94, 96, 98

c. 891, 893, 895, 897, 899

EXERCISE 5B

1. Pick the prime numbers.

- a. $\boxed{3}$ $\boxed{43}$ $\boxed{53}$ $\boxed{63}$ b. $\boxed{7}$ $\boxed{13}$ $\boxed{23}$ $\boxed{50}$ c. $\boxed{2}$ $\boxed{5}$ $\boxed{13}$ $\boxed{1}$

2. Pick the composite numbers.

- a. $\boxed{17}$ $\boxed{93}$ $\boxed{83}$ $\boxed{113}$ b. $\boxed{39}$ $\boxed{93}$ $\boxed{41}$ $\boxed{673}$ c. $\boxed{0}$ $\boxed{25}$ $\boxed{13}$ $\boxed{19}$

3. a. 32, 33, 34, 35, 36, 38, 39, 40, 42, 44

b. 23, 29, 31, 37, 41, 43

4. Are the following pairs of numbers coprime numbers?

a. Factors of 35 = 1, 5, 7, 35

Factors of 99 = 1, 3, 9, 11, 33, 99

As 35 and 99 have no common factors other than 1, they are co-prime number.

b. Factors of 25 = 1, 5, 25

Factors of 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36

As 25 and 36 have no common factors other than 1, they are co-prime number.

c. Factors of 83 = 1, 83

Factors of 120 = 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60, 120

As 83 and 120 have no common factors other than 1, they are co-prime number.

d. Factors of 75 = 1, 3, 5, 15, 25, 75

Factors of 57 = 1, 3, 19, 57

As 3 is a common factors other than 1, 75 and 57 are not co-prime numbers.

5. Write the prime factorization of the following numbers.

$$\begin{array}{r} 2 \overline{) 64} \\ \underline{2} \\ 2 \overline{) 16} \\ \underline{2} \\ 2 \overline{) 8} \\ \underline{2} \\ 2 \overline{) 4} \\ \underline{2} \\ 2 \overline{) 2} \\ \underline{2} \\ 1 \end{array}$$

$$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$\begin{array}{r} 2 \overline{) 112} \\ \underline{2} \\ 2 \overline{) 56} \\ \underline{2} \\ 2 \overline{) 28} \\ \underline{2} \\ 2 \overline{) 14} \\ \underline{7} \\ 7 \overline{) 7} \\ \underline{7} \\ 1 \end{array}$$

$$112 = 2 \times 2 \times 2 \times 2 \times 7$$

$$\begin{array}{r} 5 \overline{) 125} \\ \underline{5} \\ 5 \overline{) 25} \\ \underline{5} \\ 5 \overline{) 5} \\ \underline{5} \\ 1 \end{array}$$

$$125 = 5 \times 5 \times 5$$

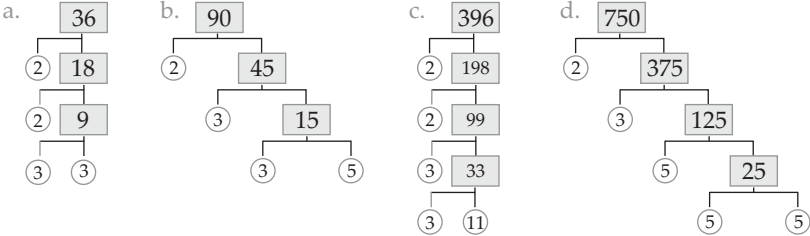
$$\begin{array}{r} 3 \overline{) 1575} \\ \underline{3} \\ 5 \overline{) 525} \\ \underline{5} \\ 5 \overline{) 175} \\ \underline{5} \\ 7 \overline{) 35} \\ \underline{7} \\ 7 \overline{) 7} \\ \underline{7} \\ 1 \end{array}$$

$$1575 = 3 \times 3 \times 5 \times 5 \times 7$$

$$\begin{array}{r} 2 \overline{) 3528} \\ \underline{2} \\ 2 \overline{) 1764} \\ \underline{2} \\ 2 \overline{) 882} \\ \underline{3} \\ 3 \overline{) 441} \\ \underline{3} \\ 7 \overline{) 147} \\ \underline{7} \\ 7 \overline{) 49} \\ \underline{7} \\ 7 \overline{) 7} \\ \underline{7} \\ 1 \end{array}$$

$$3528 = 2 \times 2 \times 2 \times 3 \times 3 \times 7 \times 7$$

6. Fill in to show prime factorization. You can only fill prime factors in the circles.



7. Write the common factors of each pair of numbers.

- a. Factors of 45 = (1) (3) (5) 9 (15) 45
 Factors of 75 = (1) (3) (5) (15) 25 75
 So, 1, 3, 5, 15 are the common factors of 45 and 75.
- b. Factors of 12 = (1) (2) (3) 4 (6) 12
 Factors of 18 = (1) (2) (3) (6) 9 18
 So, 1, 2, 3, 6 are the common factors of 12 and 18.
- c. Factors of 42 = (1) (2) 3 6 (7) (14) 21 42
 Factors of 308 = (1) (2) 4 (7) 11 (14) 22 28 44 77
 154 308
 So, 1, 2, 7, 14 are the common factors of 42 and 308.
- d. Factors of 30 = (1) 2 (3) (5) 6 10 (15) 30
 Factors of 105 = (1) (3) (5) 7 (15) 21 35 105
 So, 1, 3, 5, 15 are the common factors of 30 and 105.

EXERCISE 5 C

1. Find the numbers that are divisible by the ringed number.

- a. 59, 96, 143, 5628 (2)
- b. 70, 48, 235, 8 652 (5)
- c. 175, 2 860, 4 005, 5 800 (10)
- d. 143, 624, 5043, 2 670 (3)

2. Which of the following numbers are divisible by 9?

- A number is divisible by 9 if the sum of its digits is divisible by 9.
- a. 117 = 1+1+7=9 (divisible)
 - 423 = 4+2+3=9 (divisible)
 - 1287 = 1+2+8+7=18 (divisible)
 - 4736 = 4+7+3+6=20 (not divisible)
- So, 117, 423 and 1287 are divisible by 9.

- b. $891 = 8+9+1=18$ (divisible)
 $769 = 7+6+9=22$ (not divisible)
 $3141 = 3+1+4+1=9$ (divisible)
 $1035 = 1+0+3+5=9$ (divisible)
 So, 891, 3141 and 1035 are divisible by 9.

- c. $666 = 6+6+6=18$ (divisible)
 $949 = 9+4+9=22$ (not divisible)
 $8685 = 8+6+8+5=27$ (divisible)
 $25506 = 2+5+5+0+6=18$ (divisible)
 So, 666, 8685 and 25506 are divisible by 9.

3. Find the sums of the digits in the odd and even places separately. If their difference is divisible by 11, the number is divisible by 11.

- a. $289 \longrightarrow 9+2=11, \quad 11-8=3$
 $605 \longrightarrow 5+6=11, \quad 11-0=11$
 $1848 \longrightarrow 4+2=6, \quad 6-3=3$
 $93808 \longrightarrow 8+8+9=25, \quad 0+3=3, \quad 25-3=32$
 So, 605 and 93808 are divisible by 11.

- b. $191 \longrightarrow 1+1=2, \quad 9-2=7$
 $326 \longrightarrow 6+3=9, \quad 9-2=7$
 $814 \longrightarrow 4+8=12, \quad 12-1=11$
 $67441 \longrightarrow 1+4+6=11, \quad 4+7=11, \quad 11-11=0$
 So, 814 and 67441 are divisible by 11.

- c. $178 \longrightarrow 8+1=9, \quad 9-7=2$
 $847 \longrightarrow 7+8=15, \quad 15-4=11$
 $1234 \longrightarrow 4+2=6, \quad 3+1=4, \quad 6-4=2$
 $91718 \longrightarrow 8+7+9=24, \quad 1+1=2, \quad 24-2=22$
 So, 847 and 91718 are divisible by 11.

4. Find the difference between the double the last digit and the rest of number. If the difference is divisible by 7, the number is divisible by 7.

- a. $97 \longrightarrow$ Double of last digit is 14. The rest number is 9. Their difference is $14-9=5$, Which is not divisible by 7.
 $605 \longrightarrow$ Double of last digit is 10. The rest number is 60. Their difference is $60-10=50$, Which is not divisible by 7.
 $301 \longrightarrow$ Double of last digit is 2. The rest number is 30. Their difference is $30-2=28$, Which is not divisible by 7.
 $2135 \longrightarrow$ Double of last digit is 10. The rest number is 213. Their difference is $213-10=203$, Is 203 divisible by 7? Double is $20-6=14$, Which is divisible by 7.

So, 301 and 2135 are divisible by 7.

- b. 133 \longrightarrow Double of last digit is 6. The rest number is 13. Their difference is $13 - 6 = 7$, Which is divisible by 7.
- 504 \longrightarrow Double of last digit is 8. The rest number is 50. Their difference is $50 - 8 = 42$, Which is divisible by 7.
- 644 \longrightarrow Double of last digit is 8. The rest number is 64. Their difference is $64 - 8 = 56$, Which is divisible by 7.
- 5439 \longrightarrow Double of last digit is 18. The rest number is 543. Their difference is $543 - 18 = 525$, Is 525 divisible by 7? Double of last digit is 10. The rest number is 52. Their difference is $52 - 10 = 42$, Which is divisible by 7.
- So, 133, 504, 644 and 5439 are divisible by 7.
- c. 91 \longrightarrow Double of last digit is 2. The rest number is 9. Their difference is $9 - 2 = 7$, Which is divisible by 7.
- 452 \longrightarrow Double of last digit is 4. The rest number is 45. Their difference is $45 - 4 = 41$, Which is not divisible by 7.
- 247 \longrightarrow Double of last digit is 14. The rest number is 24. Their difference is $24 - 14 = 10$, Which is not divisible by 7.
- 3248 \longrightarrow Double of last digit is 16. The rest number is 324. Their difference is $324 - 16 = 308$, Is 308 divisible by 7? Double of last digit is 16. The rest number is 30. Their difference is $30 - 16 = 14$, Which is divisible by 7.
- So, 91 and 3248 are divisible by 7.

5. a. 234 \longrightarrow even, $2 + 3 + 4 = 9$, 7016 \longrightarrow even, $7 + 0 + 1 + 6 = 14$,
25314 \longrightarrow even, $2 + 5 + 3 + 1 + 4 = 15$
So, 7016 is divisible by 2 but not by 6.
- b. 644 \longrightarrow 44 is divisible by 4 but 644 is not divisible by 8.
3216 \longrightarrow 16 is divisible by 4 but 216 is not divisible by 8.
55100 \longrightarrow 00 is divisible by 4 but 100 is not divisible by 8.
So, 644 and 55100 are divisible by 4 but not by 8.

Chapter 6 HCF and LCM

EXERCISE 6 A

1. a. We find 8 and 16 together in the multiplication tables of 2.4 and 8.
Among these, 8 is the largest number.
 \therefore the HCF of 8 and 16 is 8.
- b. We do not find 9 and 16 together in any multiplication table.
So, the greatest number by which both 9 and 16 are divisible is 1.
 \therefore the HCF of 9 and 16 is 1.

- c. We find 20 and 28 together in the multiplication tables of 2 and 4.
Among these, 4 is the largest number.
 \therefore the HCF of 20 and 28 is 4.
- d. We find 54 and 81 together in the multiplication tables of 3, 9 and 27.
Among these, 27 is the largest number.
 \therefore the HCF of 54 and 81 is 27.
2. a. We find 42 and 84 together in the multiplication tables of 2, 3, 6, 7, 14, 21 and 42.
Among these, 42 is the largest number.
 \therefore the HCF of 42 and 84 is 42.
- b. We find 36 and 63 together in the multiplication tables of 3 and 9.
Among these, 9 is the largest number.
 \therefore the HCF of 36 and 63 is 9.
- c. We find 25 and 90 together in the multiplication tables of 5.
 \therefore the HCF of 25 and 90 is 5.
- d. We find 24 and 33 together in the multiplication tables of 3.
 \therefore the HCF of 24 and 33 is 3.

3. a.
$$\begin{array}{r|l} 2 & 10 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$\therefore 10 = 2 \times 5$

So, the factors of 10 are 1, 2 and 5.

\therefore the common factors of 10 and 15 are 1 and 5.

\therefore HCF is 5.

$$\begin{array}{r|l} 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$\therefore 15 = 3 \times 5$

So, the factors of 15 are 1, 3 and 5.

b.
$$\begin{array}{r|l} 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$\therefore 6 = 2 \times 3$

So, the factors of 6 are 1, 2 and 3.

\therefore the common factors of 6 and 9 are 1 and 3.

\therefore HCF is 3.

$$\begin{array}{r|l} 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$\therefore 9 = 3 \times 3$

So, the factors of 9 are 1, 3 and 3.

c.
$$\begin{array}{r|l} 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$\therefore 30 = 2 \times 3 \times 5$

So, the factors of 30 are 1, 2, 3, 5, 6, 10, 15 and 30.

\therefore the common factors of 30 and 45 are 30 and 45 are 1, 3, 5 and 15.

\therefore HCF = 15.

$$\begin{array}{r|l} 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$\therefore 45 = 3 \times 3 \times 5$

So, the factors of 45 are 1, 3, 5, 9, 15 and 45.

$$\begin{array}{r} 2 \overline{)72} \\ \underline{2} \ 36 \\ \underline{2} \ 18 \\ \underline{3} \ 9 \\ \underline{3} \ 3 \\ \underline{\quad} \ 1 \end{array}$$

$$\therefore 72 = 2 \times 2 \times 2 \times 3 \times 3$$

So, the factors of 72 are 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36 and 72.

\therefore the common factors of 72 and 90 are 1, 2, 3, 6, 9 and 18.

\therefore HCF = 18.

$$\begin{array}{r} 2 \overline{)90} \\ \underline{3} \ 45 \\ \underline{3} \ 15 \\ \underline{5} \ 5 \\ \underline{\quad} \ 1 \end{array}$$

$$\therefore 90 = 2 \times 3 \times 3 \times 5$$

So, the factors of 90 are 1, 2, 3, 5, 6, 9, 15, 18, 30, 45 and 90.

$$\begin{array}{r} 2 \overline{)20} \\ \underline{2} \ 10 \\ \underline{5} \ 5 \\ \underline{\quad} \ 1 \end{array}$$

$$\therefore 20 = 2 \times 2 \times 5$$

So, the factors of 20 are 1, 2, 4, 5, 10 and 20.

\therefore the common factors of 20 and 32 are 1, 2 and 4.

\therefore HCF = 4.

$$\begin{array}{r} 2 \overline{)32} \\ \underline{2} \ 16 \\ \underline{2} \ 8 \\ \underline{2} \ 4 \\ \underline{2} \ 2 \\ \underline{\quad} \ 1 \end{array}$$

$$\therefore 32 = 2 \times 2 \times 2 \times 2 \times 2$$

So, the factors of 32 are 1, 2, 4, 8, 16 and 32.

$$\begin{array}{r} 2 \overline{)36} \\ \underline{2} \ 18 \\ \underline{3} \ 9 \\ \underline{3} \ 3 \\ \underline{\quad} \ 1 \end{array}$$

$$\therefore 36 = 2 \times 2 \times \textcircled{3} \times \textcircled{3}$$

The common prime factors are 3 and 3.

\therefore HCF = $3 \times 3 = 9$.

$$\begin{array}{r} 3 \overline{)81} \\ \underline{3} \ 27 \\ \underline{3} \ 9 \\ \underline{3} \ 3 \\ \underline{\quad} \ 1 \end{array}$$

$$\therefore 81 = \textcircled{3} \times \textcircled{3} \times 3 \times 3$$

$$\begin{array}{r} 2 \overline{)30} \\ \underline{3} \ 15 \\ \underline{5} \ 5 \\ \underline{\quad} \ 1 \end{array}$$

$$\therefore 30 = 2 \times \textcircled{3} \times \textcircled{5}$$

The common prime factors are 3 and 5.

\therefore HCF = $3 \times 5 = 15$.

$$\begin{array}{r} 3 \overline{)75} \\ \underline{5} \ 25 \\ \underline{5} \ 5 \\ \underline{\quad} \ 1 \end{array}$$

$$\therefore 75 = \textcircled{3} \times \textcircled{5} \times 5$$

$$\begin{array}{r} 2 \overline{)56} \\ \underline{2} \ 28 \\ \underline{2} \ 14 \\ \underline{7} \ 7 \\ \underline{\quad} \ 1 \end{array}$$

$$\therefore 56 = \textcircled{2} \times \textcircled{2} \times 2 \times \textcircled{7}$$

The common prime factors are 2, 2 and 7.

\therefore HCF = $2 \times 2 \times 7 = 28$.

$$\begin{array}{r} 2 \overline{)84} \\ \underline{2} \ 42 \\ \underline{3} \ 21 \\ \underline{7} \ 7 \\ \underline{\quad} \ 1 \end{array}$$

$$\therefore 84 = \textcircled{2} \times \textcircled{2} \times 3 \times \textcircled{7}$$

$$\begin{array}{r|l} 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\therefore 64 = \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times \textcircled{2}$$

$$\begin{array}{r|l} 2 & 80 \\ \hline 2 & 40 \\ \hline 2 & 20 \\ \hline 2 & 10 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 80 = \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times 5$$

The common prime factors are 2, 2, 2 and 2.

$$\therefore \text{HCF} = 2 \times 2 \times 2 \times 2 = 16.$$

5. a.
$$\begin{array}{r|l} 2 & 48 \\ \hline 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 48 = \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times 3$$

$$\begin{array}{r|l} 2 & 128 \\ \hline 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\therefore 128 = \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times 2 \times 2 \times 2$$

The common prime factors are 2, 2, 2 and 2.

$$\therefore \text{HCF} = 2 \times 2 \times 2 \times 2 = 16.$$

b.
$$\begin{array}{r|l} 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 45 = 3 \times \textcircled{3} \times \textcircled{5}$$

$$\begin{array}{r|l} 3 & 105 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 105 = \textcircled{3} \times \textcircled{5} \times 7$$

The common prime factors are 3 and 5.

$$\therefore \text{HCF} = 3 \times 5 = 15.$$

c.
$$\begin{array}{r|l} 2 & 66 \\ \hline 3 & 33 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$$

$$\therefore 66 = \textcircled{2} \times \textcircled{3} \times \textcircled{11}$$

$$\begin{array}{r|l} 2 & 198 \\ \hline 3 & 99 \\ \hline 3 & 33 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$$

$$\therefore 198 = \textcircled{2} \times \textcircled{3} \times 3 \times \textcircled{11}$$

The common prime factors are 2, 3 and 11.

$$\therefore \text{HCF} = 2 \times 3 \times 11 = 66.$$

d.
$$\begin{array}{r|l} 2 & 72 \\ \hline 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 72 = 2 \times 2 \times \textcircled{2} \times \textcircled{3} \times \textcircled{3}$$

$$\begin{array}{r|l} 2 & 126 \\ \hline 3 & 63 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 126 = \textcircled{2} \times \textcircled{3} \times \textcircled{3} \times 7$$

The common prime factors are 2, 3 and 3.

$$\therefore \text{HCF} = 2 \times 3 \times 3 = 18.$$

$$\begin{array}{r} 2 \overline{) 38} \\ \underline{19} \\ 19 \\ \underline{19} \\ 1 \end{array}$$

$$\therefore 38 = 2 \times \textcircled{19}$$

$$\begin{array}{r} 3 \overline{) 57} \\ \underline{19} \\ 19 \\ \underline{19} \\ 1 \end{array}$$

$$\therefore 57 = 3 \times \textcircled{19}$$

$$\begin{array}{r} 2 \overline{) 76} \\ \underline{2} \\ 38 \\ \underline{19} \\ 19 \\ \underline{19} \\ 1 \end{array}$$

$$\therefore 76 = 2 \times 2 \times \textcircled{19}$$

The common prime factors is 19

$$\therefore \text{HCF} = 19.$$

$$\begin{array}{r} 2 \overline{) 36} \\ \underline{2} \\ 18 \\ \underline{3} \\ 9 \\ \underline{3} \\ 3 \\ \underline{3} \\ 1 \end{array}$$

$$\therefore 36 = \textcircled{2} \times \textcircled{2} \times \textcircled{3} \times 3$$

$$\begin{array}{r} 2 \overline{) 48} \\ \underline{2} \\ 24 \\ \underline{2} \\ 12 \\ \underline{2} \\ 6 \\ \underline{3} \\ 3 \\ \underline{3} \\ 1 \end{array}$$

$$\therefore 48 = \textcircled{2} \times \textcircled{2} \times 2 \times 2 \times \textcircled{3}$$

$$\begin{array}{r} 2 \overline{) 84} \\ \underline{2} \\ 42 \\ \underline{2} \\ 21 \\ \underline{3} \\ 7 \\ \underline{7} \\ 1 \end{array}$$

$$\therefore 84 = \textcircled{2} \times \textcircled{2} \times \textcircled{3} \times 7$$

The common prime factors are 2, 2 and 3.

$$\therefore \text{HCF} = 2 \times 2 \times 3 = 12.$$

$$\begin{array}{r} 3 \overline{) 63} \\ \underline{3} \\ 21 \\ \underline{7} \\ 7 \\ \underline{7} \\ 1 \end{array}$$

$$\therefore 63 = \textcircled{3} \times \textcircled{3} \times 7$$

$$\begin{array}{r} 3 \overline{) 81} \\ \underline{3} \\ 27 \\ \underline{3} \\ 9 \\ \underline{3} \\ 3 \\ \underline{3} \\ 1 \end{array}$$

$$\therefore 81 = \textcircled{3} \times \textcircled{3} \times 3 \times 3$$

$$\begin{array}{r} 2 \overline{) 108} \\ \underline{2} \\ 54 \\ \underline{2} \\ 27 \\ \underline{3} \\ 9 \\ \underline{3} \\ 3 \\ \underline{3} \\ 1 \end{array}$$

$$\therefore 108 = 2 \times 2 \times \textcircled{3} \times \textcircled{3} \times 3$$

The common prime factors are 3 and 3.

$$\therefore \text{HCF} = 3 \times 3 = 9.$$

$$\begin{array}{r} 2 \overline{) 54} \\ \underline{2} \\ 27 \\ \underline{3} \\ 9 \\ \underline{3} \\ 3 \\ \underline{3} \\ 1 \end{array}$$

$$\therefore 54 = \textcircled{2} \times \textcircled{3} \times \textcircled{3} \times 3$$

$$\begin{array}{r} 2 \overline{) 72} \\ \underline{2} \\ 36 \\ \underline{2} \\ 18 \\ \underline{2} \\ 9 \\ \underline{3} \\ 3 \\ \underline{3} \\ 1 \end{array}$$

$$\therefore 72 = \textcircled{2} \times 2 \times 2 \times \textcircled{3} \times \textcircled{3}$$

$$\begin{array}{r} 2 \overline{) 90} \\ \underline{2} \\ 45 \\ \underline{3} \\ 15 \\ \underline{3} \\ 5 \\ \underline{5} \\ 1 \end{array}$$

$$\therefore 90 = \textcircled{2} \times \textcircled{3} \times \textcircled{3} \times 5$$

The common prime factors are 2, 3 and 3.

$$\therefore \text{HCF} = 2 \times 3 \times 3 = 18.$$

EXERCISE 6 B

1. a. The greatest number that will divide 27 and 33 exactly is their greatest common divisor, or HCF.

$$\begin{array}{r} 3 \overline{) 27} \\ \underline{3} \\ 9 \\ \underline{3} \\ 3 \\ \underline{3} \\ 1 \end{array}$$

$$\therefore 27 = 3 \times 3 \times 3$$

$$\begin{array}{r} 3 \overline{) 33} \\ \underline{11} \\ 11 \\ \underline{11} \\ 1 \end{array}$$

$$\therefore 33 = 3 \times 11$$

The required HCF is 3. So, 3 is the greatest number that will divide 27 and 33 exactly.

- b. The greatest number that will divide 48, 60 and 64 exactly is their greatest common divisor, or HCF.

$$\begin{array}{r|l} 2 & 48 \\ \hline 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 60 \\ \hline 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline 7 & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\therefore 48 = 2 \times 2 \times 2 \times 2 \times 3 \quad \therefore 60 = 2 \times 2 \times 3 \times 5 \quad \therefore 64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

The required HCF is $2 \times 2 = 4$. So, 4 is the greatest number that will divide 48, 60 and 64 exactly.

2. a. 51 divided by the number leaves 9 as remainder. So, the number divides $51 - 9 = 42$ exactly.

79 divided by the number leaves 9 as remainder. So the number divides $79 - 9 = 70$ exactly.

$$\begin{array}{r|l} 2 & 42 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 70 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 42 = 2 \times 3 \times 7 \quad \therefore 70 = 2 \times 5 \times 7$$

The HCF of 42 and 70 is $2 \times 7 = 14$. So, the required number is 14.

- b. 33 divided by the number leaves 3 as remainder. So, the number divides $33 - 3 = 30$ exactly.

45 divided by the number leaves 3 as remainder. So the number divides $45 - 3 = 42$ exactly.

The greatest number that will divide 30 and 42 exactly is their HCF.

$$\begin{array}{r|l} 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 42 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 30 = 2 \times 3 \times 5 \quad \therefore 42 = 2 \times 3 \times 7$$

The HCF of 30 and 42 is $2 \times 3 = 6$. So, the required number is 6.

3. 49 divided by the number leaves 7 as remainder. So, the number divides $49 - 7 = 42$ exactly.

79 divided by the number leaves 7 as remainder. So, the number divides $79 - 7 = 72$ exactly.

91 divided by the number leaves 7 as remainder. So, the number divides $91 - 7 = 84$ exactly.

The biggest number that will divide 42, 72 and 84 exactly is their HCF.

$$\begin{array}{r|l} 2 & 42 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 42 = 2 \times 3 \times 7$$

$$\begin{array}{r|l} 2 & 72 \\ \hline 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 72 = 2 \times 2 \times 2 \times 3 \times 3$$

$$\begin{array}{r|l} 2 & 84 \\ \hline 2 & 42 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 84 = 2 \times 2 \times 3 \times 7$$

The HCF of 42, 72 and 84 is $2 \times 3 = 6$. So, the required number is 6.

4. a. 57 divided by the number leaves 7 as remainder. So, the number divides $57 - 7 = 50$ exactly.

133 divided by the number leaves 8 as remainder. So, the number divides $133 - 8 = 125$ exactly.

384 divided by the number leaves 9 as remainder. So, the number divides $384 - 9 = 375$ exactly.

The greatest number that will divide 50, 125 and 375 exactly is their HCF.

$$\begin{array}{r|l} 2 & 50 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 50 = 2 \times 5 \times 5$$

$$\begin{array}{r|l} 5 & 125 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 125 = 5 \times 5 \times 5$$

$$\begin{array}{r|l} 3 & 375 \\ \hline 5 & 125 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 375 = 3 \times 5 \times 5 \times 5$$

The HCF of 50, 125 and 375 is $5 \times 5 = 25$. So, the required number is 25.

- b. 27 divided by the number leaves 3 as remainder. So, the number divides $27 - 3 = 24$ exactly.

41 divided by the number leaves 5 as remainder. So, the number divides $41 - 5 = 36$ exactly.

50 divided by the number leaves 2 as remainder. So, the number divides $50 - 2 = 48$ exactly.

The greatest number that will divide 24, 36 and 48 exactly is their HCF.

$$\begin{array}{r|l} 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 24 = 2 \times 2 \times 2 \times 3$$

$$\begin{array}{r|l} 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 36 = 2 \times 2 \times 3 \times 3$$

$$\begin{array}{r|l} 2 & 48 \\ \hline 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 48 = 2 \times 2 \times 2 \times 2 \times 3$$

The HCF of 24, 36 and 48 is $2 \times 2 \times 3 = 12$. So, the required number is 12.

5. The required length will have to divide 18 and 24 exactly.

$$\begin{array}{r|l} 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 18 = 2 \times 3 \times 3$$

$$\begin{array}{r|l} 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 24 = 2 \times 2 \times 2 \times 3$$

The HCF of 18 and 24 is $2 \times 3 = 6$

So, the greatest possible length of wire is 6 m.

EXERCISE 6 C

1.
 - a. We have to find the smallest common number or multiple in the tables of 4 and 8. 8 is the smallest multiple that occurs in both the tables.
∴ the LCM of 4 and 8 is 8.
 - b. We have to find the smallest common number multiple in the tables of 3 and 9. 9 is the smallest multiple that occurs in both the tables.
∴ the LCM of 3 and 9 is 9.
 - c. We have to find the smallest common number or multiple in the tables of 8 and 20. 40 is the smallest multiple that occurs in both the tables.
∴ the LCM of 8 and 20 is 40.
 - d. We have to find the smallest common number or multiple in the tables of 5 and 7. 35 is the smallest multiple that occurs in both the tables.
∴ the LCM of 5 and 7 is 35.
2.
 - a. We have to find the smallest common number or multiple in the tables of 4 and 8. 24 is the smallest multiple that occurs in both the tables.
∴ the LCM of 6 and 8 is 24.
 - b. We have to find the smallest common number or multiple in the tables of 10 and 12. 60 is the smallest multiple that occurs in both the tables.
∴ the LCM of 10 and 12 is 60.
 - c. We have to find the smallest common number or multiple in the tables of 16 and 24. 48 is the smallest multiple that occurs in both the tables.
∴ the LCM of 16 and 24 is 48.
 - d. We have to find the smallest common number or multiple in the tables of 14 and 21. 42 is the smallest multiple that occurs in both the tables.
∴ the LCM of 14 and 21 is 42.
3.
 - a. We have to find the smallest common multiple that occurs in the tables of 2, 4 and 5.
20 is the smallest multiple that occurs in the three tables.
∴ the LCM of 2, 4 and 5 is 20.
 - b. We have to find the smallest common multiple that occurs in the tables of 2, 3 and 9.
18 is the smallest multiple that occurs in the three tables.
∴ the LCM of 2, 3 and 9 is 18.
 - c. We have to find the smallest common multiple that occurs in the tables of 3, 4 and 8.
24 is the smallest multiple that occurs in the three tables.
∴ the LCM of 3, 4 and 8 is 24.

- d. We have to find the smallest common multiple that occurs in the tables of 5, 10 and 15.
30 is the smallest multiple that occurs in the three tables.
 \therefore the LCM of 5, 10 and 15 is 30.
- e. We have to find the smallest common multiple that occurs in the tables of 5, 12 and 30.
60 is the smallest multiple that occurs in the three tables.
 \therefore the LCM of 5, 12 and 30 is 60.
- f. We have to find the smallest common multiple that occurs in the tables of 3, 12 and 24.
24 is the smallest multiple that occurs in the three tables.
 \therefore the LCM of 3, 12 and 24 is 24.
- g. We have to find the smallest common multiple that occurs in the tables of 4, 8 and 10.
40 is the smallest multiple that occurs in the three tables.
 \therefore the LCM of 4, 8 and 10 is 40.
- h. We have to find the smallest common multiple that occurs in the tables of 6, 12 and 18.
36 is the smallest multiple that occurs in the three tables.
 \therefore the LCM of 6, 12 and 18 is 36.
4. a. We have to find the smallest common multiple that occurs in the tables of 5, 8 and 11.
440 is the smallest multiple that occurs in the three tables.
 \therefore the LCM of 5, 8 and 11 is 440.
- b. We have to find the smallest common multiple that occurs in the tables of 4, 7 and 9.
252 is the smallest multiple that occurs in the three tables.
 \therefore the LCM of 4, 7 and 9 is 252.
- c. We have to find the smallest common multiple that occurs in the tables of 5, 6 and 7.
210 is the smallest multiple that occurs in the three tables.
 \therefore the LCM of 5, 6 and 7 is 210.
- d. We have to find the smallest common multiple that occurs in the tables of 3, 4 and 5.
60 is the smallest multiple that occurs in the three tables.
 \therefore the LCM of 3, 4 and 5 is 60.

EXERCISE 6 D

1. a.
$$\begin{array}{r|l} 2 & 10 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 10 = 2 \times 5$$

$$12 = 2 \times 2 \times 3$$

The LCM of 10 and 12 is

$$2 \times 2 \times 3 \times 5 = 60$$

b.
$$\begin{array}{r|l} 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 144 \\ \hline 2 & 72 \\ \hline 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 36 = 2 \times 2 \times 3 \times 3$$

$$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$$

The LCM of 36 and 144 is

$$2 \times 2 \times 2 \times 2 \times 3 \times 3 = 144$$

c.
$$\begin{array}{r|l} 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 120 \\ \hline 2 & 60 \\ \hline 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$120 = 2 \times 2 \times 2 \times 3 \times 5$$

The LCM of 64 and 120 is

$$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5 = 960$$

d.
$$\begin{array}{r|l} 2 & 42 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 50 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 42 = 2 \times 3 \times 7$$

$$50 = 2 \times 5 \times 5$$

The LCM of 42 and 50 is

$$2 \times 3 \times 5 \times 5 \times 7 = 1050$$

2. a.
$$\begin{array}{r|l} 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 30 = 2 \times 3 \times 5$$

$$49 = 7 \times 7$$

The LCM of 30 and 49 is

$$2 \times 3 \times 5 \times 7 \times 7 = 1470$$

b.
$$\begin{array}{r|l} 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 56 \\ \hline 2 & 28 \\ \hline 2 & 14 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 32 = 2 \times 2 \times 2 \times 2 \times 2$$

$$56 = 2 \times 2 \times 2 \times 7$$

The LCM of 32 and 56 is

$$2 \times 2 \times 2 \times 2 \times 2 \times 7 = 224$$

c.
$$\begin{array}{r|l} 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 24 = 2 \times 2 \times 2 \times 3$$

$$36 = 2 \times 2 \times 3 \times 3$$

The LCM of 24 and 36 is

$$2 \times 2 \times 2 \times 3 \times 3 = 72$$

d.
$$\begin{array}{r|l} 5 & 55 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 5 & 85 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\therefore 55 = 5 \times 11$$

$$85 = 5 \times 17$$

The LCM of 55 and 85 is

$$5 \times 11 \times 17 = 935$$

3. a.
$$\begin{array}{r|l} 2 & 72 \\ \hline 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 96 \\ \hline 2 & 48 \\ \hline 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$\therefore 72 = 2 \times 2 \times 2 \times 3 \times 3$
 $96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$
 The LCM of 72 and 96 is
 $2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 288$

b.
$$\begin{array}{r|l} 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 3 & 147 \\ \hline 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$\therefore 49 = 7 \times 7$
 $147 = 3 \times 7 \times 7$
 The LCM of 49 and 147 is
 $3 \times 7 \times 7 = 147$

c.
$$\begin{array}{r|l} 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 3 & 75 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$\therefore 35 = 5 \times 7$
 $75 = 3 \times 5 \times 5$
 The LCM of 35 and 75 is
 $3 \times 5 \times 5 \times 7 = 525$

d.
$$\begin{array}{r|l} 2 & 108 \\ \hline 2 & 54 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 144 \\ \hline 2 & 72 \\ \hline 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$\therefore 108 = 2 \times 2 \times 3 \times 3 \times 3$
 $144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$
 The LCM of 108 and 144 is
 $2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 = 432$

4. a.
$$\begin{array}{r|l} 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 3 & 33 \\ \hline 11 & 11 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$\therefore 27 = 3 \times 3 \times 3$
 $33 = 3 \times 11$
 $45 = 3 \times 3 \times 5$
 The LCM of 27, 33 and 45 is
 $3 \times 3 \times 3 \times 5 \times 11 = 1485$

b.
$$\begin{array}{r|l} 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 52 \\ \hline 2 & 26 \\ \hline 13 & 13 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 3 & 75 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$\therefore 18 = 2 \times 3 \times 3$
 $52 = 2 \times 2 \times 13$
 $75 = 3 \times 5 \times 5$
 The LCM of 18, 52 and 75 is
 $2 \times 2 \times 3 \times 3 \times 5 \times 5 \times 13 = 11700$

c.
$$\begin{array}{r|l} 2 & 60 \\ \hline 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 72 \\ \hline 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 96 \\ \hline 2 & 48 \\ \hline 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$\therefore 60 = 2 \times 2 \times 3 \times 5$
 $72 = 2 \times 2 \times 2 \times 3 \times 3$
 $96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$
 The LCM of 60, 72 and 96 is
 $2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 1440$

d.
$$\begin{array}{r|l} 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 90 \\ \hline 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 180 \\ \hline 2 & 90 \\ \hline 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$\therefore 25 = 5 \times 5$
 $90 = 2 \times 3 \times 3 \times 5$
 $180 = 2 \times 2 \times 3 \times 3 \times 5$
 The LCM of 25, 90 and 180 is
 $2 \times 2 \times 3 \times 3 \times 5 \times 5 = 900$

$$\begin{array}{r}
 2 \overline{) 256} \\
 \underline{2 \ 128} \\
 2 \ 64 \\
 \underline{2 \ 32} \\
 2 \ 16 \\
 \underline{2 \ 8} \\
 2 \ 4 \\
 \underline{2 \ 2} \\
 1
 \end{array}
 \qquad
 \begin{array}{r}
 2 \overline{) 308} \\
 \underline{2 \ 154} \\
 7 \ 77 \\
 \underline{11 \ 11} \\
 1
 \end{array}
 \qquad
 \begin{array}{r}
 2 \overline{) 528} \\
 \underline{2 \ 264} \\
 2 \ 132 \\
 \underline{2 \ 66} \\
 3 \ 33 \\
 \underline{11 \ 11} \\
 1
 \end{array}$$

$$\begin{array}{r}
 5 \overline{) 175} \\
 \underline{5 \ 35} \\
 7 \ 7 \\
 \underline{7 \ 7} \\
 1
 \end{array}
 \qquad
 \begin{array}{r}
 2 \overline{) 168} \\
 \underline{2 \ 84} \\
 2 \ 42 \\
 \underline{3 \ 21} \\
 7 \ 7 \\
 \underline{7 \ 7} \\
 1
 \end{array}
 \qquad
 \begin{array}{r}
 2 \overline{) 350} \\
 \underline{5 \ 175} \\
 5 \ 35 \\
 \underline{7 \ 7} \\
 1
 \end{array}$$

$$\therefore 256 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$308 = 2 \times 2 \times 7 \times 11$$

$$528 = 2 \times 2 \times 2 \times 2 \times 3 \times 11$$

The LCM of 256, 308 and 528 is

$$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 7 \times 11 = 59136$$

$$\therefore 175 = 5 \times 5 \times 7$$

$$168 = 2 \times 2 \times 2 \times 3 \times 7$$

$$350 = 2 \times 5 \times 5 \times 7$$

The LCM of 175, 168 and 350 is

$$2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 7 = 4200$$

$$\begin{array}{r}
 2 \overline{) 102} \\
 \underline{3 \ 51} \\
 17 \ 17 \\
 \underline{17 \ 17} \\
 1
 \end{array}
 \qquad
 \begin{array}{r}
 2 \overline{) 170} \\
 \underline{5 \ 85} \\
 17 \ 17 \\
 \underline{17 \ 17} \\
 1
 \end{array}
 \qquad
 \begin{array}{r}
 2 \overline{) 136} \\
 \underline{2 \ 68} \\
 2 \ 34 \\
 \underline{17 \ 17} \\
 1
 \end{array}$$

$$\therefore 102 = 2 \times 3 \times 17$$

$$170 = 2 \times 5 \times 17$$

$$136 = 2 \times 2 \times 2 \times 17$$

The LCM of 102, 170 and 136 is

$$2 \times 2 \times 2 \times 3 \times 5 \times 17 = 2040$$

$$\begin{array}{r}
 2 \overline{) 110} \\
 \underline{5 \ 55} \\
 11 \ 11 \\
 \underline{11 \ 11} \\
 1
 \end{array}
 \qquad
 \begin{array}{r}
 2 \overline{) 132} \\
 \underline{2 \ 66} \\
 3 \ 33 \\
 \underline{11 \ 11} \\
 1
 \end{array}
 \qquad
 \begin{array}{r}
 2 \overline{) 154} \\
 \underline{7 \ 77} \\
 11 \ 11 \\
 \underline{11 \ 11} \\
 1
 \end{array}$$

$$\therefore 110 = 2 \times 5 \times 11$$

$$132 = 2 \times 2 \times 3 \times 11$$

$$154 = 2 \times 7 \times 11$$

The LCM of 110, 132 and 154 is

$$2 \times 2 \times 3 \times 5 \times 7 \times 11 = 4620$$

EXERCISE 6 E

1. a. A number that is divisible by 9 and 15 has to be a multiple of each number.

So, the smallest number that is divisible by 9 and 15 is their lowest common multiple (LCM).

$$\begin{array}{r}
 3 \overline{) 9} \\
 \underline{3 \ 3} \\
 1
 \end{array}$$

$$\therefore 9 = 3 \times 3$$

$$\begin{array}{r}
 3 \overline{) 15} \\
 \underline{5 \ 5} \\
 1
 \end{array}$$

$$\therefore 15 = 3 \times 5$$

The LCM of 9 and 15 is $3 \times 3 \times 5 = 45$.

So, the smallest number that is divisible by 9 and 15 is 45.

- b. A number that is divisible by 20 and 25 has to be a multiple of each number.

So, the smallest number that is divisible by 20 and 25 is their lowest common multiple (LCM).

$$\begin{array}{r}
 2 \overline{) 20} \\
 \underline{2 \ 10} \\
 5 \ 5 \\
 \underline{5 \ 5} \\
 1
 \end{array}$$

$$\therefore 20 = 2 \times 2 \times 5$$

$$\begin{array}{r}
 5 \overline{) 25} \\
 \underline{5 \ 5} \\
 1
 \end{array}$$

$$\therefore 25 = 5 \times 5$$

The LCM of 20 and 25 is $2 \times 2 \times 5 \times 5 = 100$.

So, the smallest number that is divisible by 20 and 25 is 100.

2. a. A number that is divisible by 3, 6 and 10 has to be a multiple of each number.
So, the smallest number that is divisible by 3, 6 and 10 is their lowest common multiple (LCM).

$$\begin{array}{r|l} 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 3 = 3$$

$$\begin{array}{r|l} 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 6 = 2 \times 3$$

$$\begin{array}{r|l} 2 & 10 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 10 = 2 \times 5$$

The LCM of 3, 6 and 10 is $2 \times 3 \times 5 = 30$.

So, the smallest number that is divisible by 3, 6 and 10 is 30.

- b. A number that is divisible by 10, 15 and 20 has to be a multiple of each other.
So, the smallest number that is divisible by 10, 15 and 20 is their lowest common multiple (LCM).

$$\begin{array}{r|l} 2 & 10 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 10 = 2 \times 5$$

$$\begin{array}{r|l} 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 15 = 3 \times 5$$

$$\begin{array}{r|l} 2 & 20 \\ \hline 2 & 10 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 20 = 2 \times 2 \times 5$$

The LCM of 10, 15 and 20 is $2 \times 2 \times 3 \times 5 = 60$.

So, the smallest number that is divisible by 10, 15 and 20 is 60.

3. a. Let us first find the smallest number that is divisible by 16 and 18.

$$\begin{array}{r|l} 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\therefore 16 = 2 \times 2 \times 2 \times 2$$

$$\begin{array}{r|l} 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 18 = 2 \times 3 \times 3$$

The LCM of 16 and 18 is $2 \times 2 \times 2 \times 2 \times 3 \times 3 = 144$.

144 is the smallest number that is divisible by 16 and 18.

So, the smallest number which when divisible by 16 and 18 leaves 6 as remainder = $144 + 6 = 150$.

- b. Let us first find the smallest number that is divisible by 24, 48 and 96.

$$\begin{array}{r|l} 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 24 = 2 \times 2 \times 2 \times 3$$

$$\begin{array}{r|l} 2 & 48 \\ \hline 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 48 = 2 \times 2 \times 2 \times 2 \times 3$$

$$\begin{array}{r|l} 2 & 96 \\ \hline 2 & 48 \\ \hline 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$$

The LCM of 24, 48 and 96 is $2 \times 2 \times 2 \times 2 \times 2 \times 3 = 96$.

96 is the smallest number that is divisible by 24, 48 and 96.

So, the smallest number which when divisible by 24, 48 and 96 leaves 4 as remainder = $96 + 4 = 100$.

4. The number of chairs has to be a multiple of both 9 and 15.

We have to find their LCM.

$$\begin{array}{r} 3 \overline{) 9} \\ \underline{3} \\ 3 \\ \underline{3} \\ 0 \\ 1 \end{array}$$

$$\therefore 9 = 3 \times 3$$

$$\begin{array}{r} 3 \overline{) 15} \\ \underline{5} \\ 5 \\ \underline{5} \\ 0 \\ 1 \end{array}$$

$$\therefore 15 = 3 \times 5$$

The LCM of 9 and 15 is $3 \times 3 \times 5 = 45$.

So, the number of chairs is 45.

5. The time of traffic lights change together again has to be a multiple of 10, 15 and 20.

We have to find their LCM

$$\begin{array}{r} 2 \overline{) 10} \\ \underline{5} \\ 5 \\ \underline{5} \\ 0 \\ 1 \end{array}$$

$$\therefore 10 = 2 \times 5$$

$$\begin{array}{r} 3 \overline{) 15} \\ \underline{5} \\ 5 \\ \underline{5} \\ 0 \\ 1 \end{array}$$

$$\therefore 15 = 3 \times 5$$

$$\begin{array}{r} 2 \overline{) 20} \\ \underline{2} \overline{) 10} \\ \underline{5} \\ 5 \\ \underline{5} \\ 0 \\ 1 \end{array}$$

$$\therefore 20 = 2 \times 2 \times 5$$

The LCM of 10, 15 and 20 is $2 \times 2 \times 3 \times 5 = 60$

The traffic lights change together again after 60 minutes.

60 minutes = 1 hour

So, traffic lights change together again at 9:00 A.M. + 1 hour = 10:00 A.M.

6. The first tile on which both land is the LCM of 2 and 3.

LAM of 2 and 3 is $2 \times 3 = 6$

So, the first tile on which both land is sixth.

Chapter 7 Fractions

EXERCISE 7A

1. a. $\frac{3}{4}$ b. $\frac{1}{3}$ c. $\frac{1}{2}$ d. $\frac{5}{9}$

2. a. $\frac{3}{4} \times 24 = \boxed{12}$ b. $\frac{1}{3} \times 33 = \boxed{11}$ c. $\frac{1}{4} \times 164 = \boxed{41}$ d. $\frac{1}{7} \times 112 = \boxed{16}$

3. a. $\frac{7}{5}$ b. $\frac{9}{4}$ c. $\frac{35}{8}$ d. $\frac{12}{7}$

$$\begin{array}{r} 5 \overline{) 7} (1 \\ \underline{-5} \\ 2 \\ = 1\frac{2}{5} \end{array} \qquad \begin{array}{r} 4 \overline{) 9} (2 \\ \underline{-8} \\ 1 \\ = 2\frac{1}{4} \end{array} \qquad \begin{array}{r} 8 \overline{) 35} (4 \\ \underline{-32} \\ 3 \\ = 4\frac{3}{8} \end{array} \qquad \begin{array}{r} 7 \overline{) 12} (1 \\ \underline{-7} \\ 5 \\ = 1\frac{5}{7} \end{array}$$

e. $\frac{56}{12}$

$$\begin{array}{r} 12 \overline{) 56} (4 \\ \underline{-48} \\ 8 \\ = 4\frac{8}{12} \end{array}$$

f. $\frac{97}{11}$

$$\begin{array}{r} 11 \overline{) 97} (8 \\ \underline{-88} \\ 9 \\ = 8\frac{9}{11} \end{array}$$

g. $\frac{42}{15}$

$$\begin{array}{r} 15 \overline{) 42} (2 \\ \underline{-30} \\ 12 \\ = 2\frac{12}{15} \end{array}$$

4. a. $4\frac{8}{9}$
 $= \frac{4 \times 9 + 8}{9}$
 $= \frac{36 + 8}{9} = \frac{44}{9}$

b. $3\frac{2}{3}$
 $= \frac{3 \times 3 + 2}{3}$
 $= \frac{9 + 2}{3} = \frac{11}{3}$

c. $9\frac{1}{4}$
 $= \frac{9 \times 4 + 1}{4}$
 $= \frac{36 + 1}{4} = \frac{37}{4}$

d. $7\frac{5}{11}$
 $= \frac{7 \times 11 + 5}{11}$
 $= \frac{77 + 5}{11} = \frac{82}{11}$

e. $8\frac{7}{10}$
 $= \frac{8 \times 10 + 7}{10}$
 $= \frac{80 + 7}{10} = \frac{87}{10}$

f. $20\frac{1}{5}$
 $= \frac{20 \times 5 + 1}{5}$
 $= \frac{100 + 1}{5} = \frac{101}{5}$

g. $7\frac{4}{9}$
 $= \frac{7 \times 9 + 4}{9}$
 $= \frac{63 + 4}{9} = \frac{67}{9}$

EXERCISE 7B

1. a. $\frac{5}{9} = \frac{5 \times 3}{9 \times 3} = \frac{15}{27}$

b. $\frac{4}{5} = \frac{4 \times 8}{5 \times 8} = \frac{32}{40}$

c. $\frac{1}{6} = \frac{1 \times 6}{6 \times 6} = \frac{6}{36}$

d. $\frac{24}{33} = \frac{24 \div 3}{33 \div 3} = \frac{8}{11}$

e. $\frac{64}{104} = \frac{64 \div 8}{104 \div 8} = \frac{8}{13}$

2. a. $\frac{1}{4} = \frac{1 \times 2}{4 \times 2} = \frac{2}{8}$

b. $\frac{2}{5} = \frac{2 \times 2}{5 \times 2} = \frac{4}{10}$

c. $\frac{11}{12} = \frac{11 \times 2}{12 \times 2} = \frac{22}{24}$

$\frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$

$\frac{2}{5} = \frac{2 \times 3}{5 \times 3} = \frac{6}{15}$

$\frac{11}{12} = \frac{11 \times 3}{12 \times 3} = \frac{33}{36}$

$\frac{1}{4} = \frac{2}{8} = \frac{3}{12}$

$\frac{2}{5} = \frac{4}{10} = \frac{6}{15}$

$\frac{11}{12} = \frac{22}{24} = \frac{33}{36}$

d. $\frac{14}{15} = \frac{14 \times 2}{15 \times 2} = \frac{28}{30}$

$\frac{14}{15} = \frac{14 \times 3}{15 \times 3} = \frac{42}{45}$

$\frac{14}{15} = \frac{28}{30} = \frac{42}{45}$

3. a. $\frac{8}{12} = \frac{8 \div 2}{12 \div 2} = \frac{4}{6}$

b. $\frac{20}{24} = \frac{20 \div 2}{24 \div 2} = \frac{10}{12}$

c. $\frac{28}{40} = \frac{28 \div 2}{40 \div 2} = \frac{14}{20}$

$\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \frac{2}{3}$

$\frac{20}{24} = \frac{20 \div 4}{24 \div 4} = \frac{5}{6}$

$\frac{28}{40} = \frac{28 \div 4}{40 \div 4} = \frac{7}{10}$

$\frac{8}{12} = \frac{4}{6} = \frac{2}{3}$

$\frac{20}{24} = \frac{10}{12} = \frac{5}{6}$

$\frac{28}{40} = \frac{14}{20} = \frac{7}{10}$

d. $\frac{44}{60} = \frac{44 \div 2}{60 \div 2} = \frac{22}{30}$

$\frac{44}{60} = \frac{44 \div 4}{60 \div 4} = \frac{11}{15}$

$\frac{44}{60} = \frac{22}{30} = \frac{11}{15}$

4. a. $\frac{7}{8}$ and $\frac{7}{16}$

Like fractions have the same denominator. LCM of the denominators of the given fractions.

$$\begin{array}{r|l} 2 & 8 \\ \hline 2 & 4 \\ 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 16 \\ \hline 2 & 8 \\ 2 & 4 \\ 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{aligned} \therefore 8 &= 2 \times 2 \times 2 \\ 16 &= 2 \times 2 \times 2 \times 2 \end{aligned}$$

The LCM of 8 and 16 is $2 \times 2 \times 2 \times 2 = 16$

$$\frac{7}{8} = \frac{7 \times 2}{8 \times 2} = \frac{14}{16} \quad \frac{7}{16} = \frac{7 \times 1}{16 \times 1} = \frac{7}{16}$$

$\frac{14}{16}$ and $\frac{7}{16}$ are the required like fractions.

b. $\frac{4}{15}$ and $\frac{5}{15}$

Like fractions have the same denominator.

So, $\frac{4}{15}$ and $\frac{5}{15}$ are the like fractions.

c. $\frac{4}{13}$ and $\frac{5}{9}$

Like fractions have the same denominator. To make equivalent like fractions. We multiply each fraction's numerator and denominator by the other fractions denominator.

$$\frac{4}{13} = \frac{4 \times 9}{13 \times 9} = \frac{36}{117}$$

$$\frac{5}{9} = \frac{5 \times 13}{9 \times 13} = \frac{65}{117}$$

So, $\frac{36}{117}$ and $\frac{65}{117}$ are the required like fractions.

d. $\frac{8}{9}$ and $\frac{6}{11}$

Like fractions have the same denominator. To make equivalent like fractions. We multiply each fraction's numerator and denominator by the other fractions denominator.

$$\frac{8}{9} = \frac{8 \times 11}{9 \times 11} = \frac{88}{99}$$

$$\frac{6}{11} = \frac{6 \times 9}{11 \times 9} = \frac{54}{99}$$

$\frac{88}{99}$ and $\frac{54}{99}$ are the required like fractions.

e. $\frac{3}{4}$ and $\frac{5}{7}$

Like fractions have the same denominator. To make equivalent like fractions. We multiply each fraction's numerator and denominator by the other fractions denominator.

$$\frac{3}{4} = \frac{3 \times 7}{4 \times 7} = \frac{21}{28} \quad \frac{5}{7} = \frac{5 \times 4}{7 \times 4} = \frac{20}{28}$$

$\frac{21}{28}$ and $\frac{20}{28}$ are the required like fractions.

f. $\frac{2}{3}$ and $\frac{3}{5}$

Like fractions have the same denominator. To make equivalent like fractions. We multiply each fraction's numerator and denominator by the other fractions denominator.

$$\frac{2}{3} = \frac{2 \times 5}{3 \times 5} = \frac{10}{15} \quad \frac{3}{5} = \frac{3 \times 3}{5 \times 3} = \frac{9}{15}$$

$\frac{10}{15}$ and $\frac{9}{15}$ are the required like fractions.

5. a. $\frac{13}{15} \times \frac{26}{30}$

$$13 \times 30 = 390$$

$$15 \times 26 = 390$$

As the products are equal,

$$\therefore \frac{13}{15} \text{ and } \frac{26}{30} \text{ are equal.}$$

b. $\frac{4}{6} \times \frac{42}{54}$

$$4 \times 54 = 216$$

$$6 \times 42 = 252$$

As the products are not equal,

$$\therefore \frac{4}{6} \text{ and } \frac{42}{54} \text{ are not equal.}$$

c. $\frac{15}{45} \times \frac{3}{5}$

$$15 \times 5 = 75$$

$$45 \times 3 = 135$$

As the products are not equal,

$$\therefore \frac{15}{45} \text{ and } \frac{3}{5} \text{ are not equal.}$$

d. $\frac{9}{14} \times \frac{36}{56}$

$$9 \times 56 = 504$$

$$14 \times 36 = 504$$

As the products are equal,

$$\therefore \frac{9}{14} \text{ and } \frac{36}{56} \text{ are equal.}$$

e. $\frac{8}{22} \times \frac{64}{176}$

$$8 \times 176 = 1408$$

$$22 \times 64 = 1408$$

As the products are equal,

$$\therefore \frac{8}{22} \text{ and } \frac{64}{176} \text{ are equal.}$$

f. $\frac{32}{40} \times \frac{4}{5}$

$$32 \times 5 = 160$$

$$40 \times 4 = 160$$

As the products are equal,

$$\therefore \frac{32}{40} \text{ and } \frac{4}{5} \text{ are equal.}$$

6. a. Among like fractions, the one with the greatest numerator is the greatest.

$$\therefore 3 < 5$$

$$\therefore \frac{3}{8} \lt \frac{5}{8}$$

b. Among like fractions, the one with the greatest numerator is the greatest.

$$\therefore 11 > 9$$

$$\therefore \frac{11}{14} \gt \frac{9}{14}$$

c. Among fractions whose numerators are equal, the one with the smallest denominator is the greatest.

$$\begin{aligned} \therefore 2 < 7 \\ \therefore \frac{1}{2} \boxed{>} \frac{1}{7} \end{aligned}$$

d. Among fractions whose numerators are equal, the one with the smallest denominator is the greatest.

$$\begin{aligned} \therefore 43 < 54 \\ \therefore \frac{21}{43} \boxed{>} \frac{21}{54} \end{aligned}$$

7. a. $5\frac{1}{2} = \frac{5 \times 2 + 1}{2} = \frac{11}{2}$

$$5\frac{1}{3} = \frac{5 \times 3 + 1}{3} = \frac{16}{3}$$

$$\frac{11}{2} \times \frac{16}{3}$$

$$11 \times 3 = 33$$

$$2 \times 16 = 32$$

$$\text{As } 33 > 32$$

$$\therefore \frac{11}{2} > \frac{16}{3} \text{ or } 5\frac{1}{2} \boxed{>} 5\frac{1}{3}$$

c. $2\frac{3}{8} = \frac{2 \times 8 + 3}{8} = \frac{19}{8}$

$$2\frac{5}{7} = \frac{2 \times 7 + 5}{7} = \frac{19}{7}$$

Among fractions whose numerators are equal, the one with the smallest denominator is the greatest

$$\therefore 8 > 7$$

$$\therefore \frac{19}{8} < \frac{19}{7} \text{ or } 2\frac{3}{8} \boxed{<} 2\frac{5}{7}$$

e. $\frac{14}{10}, 1\frac{4}{10} = \frac{1 \times 10 + 4}{10} = \frac{14}{10}$

Both the fractions have equal numerator and denominator

\therefore Both fractions are equivalent

$$\therefore 8 > 7$$

$$\frac{14}{10} \boxed{=} 1\frac{4}{10}$$

d. Among fractions whose numerators are equal, the one with the smallest denominator is the greatest.

$$\begin{aligned} \therefore 7 < 9 \\ \therefore \frac{2}{7} \boxed{>} \frac{2}{9} \end{aligned}$$

b. $4\frac{11}{21} = \frac{4 \times 21 + 11}{21} = \frac{95}{21}$

$$5\frac{2}{3} = \frac{5 \times 3 + 2}{3} = \frac{17}{3}$$

$$\frac{95}{21} \times \frac{17}{3}$$

$$95 \times 3 = 285$$

$$21 \times 17 = 357$$

$$\text{As } 285 < 357$$

$$\therefore \frac{95}{21} < \frac{17}{3} \text{ or } 4\frac{11}{21} \boxed{<} 5\frac{2}{3}$$

d. $5\frac{4}{9} = \frac{5 \times 9 + 4}{9} = \frac{49}{9}$

$$\frac{47}{9}, \frac{49}{9}$$

Among like fractions the one with the greatest numerator is the greatest.

$$\therefore 47 < 49$$

$$\therefore \frac{49}{9} < \frac{47}{9} \text{ or } \frac{47}{9} \boxed{<} 5\frac{4}{9}$$

8. a. $\frac{15}{13}, \frac{15}{17}, \frac{15}{19}, \frac{15}{21}, \frac{15}{16}$

Denominator in ascending order :
13, 16, 17, 19, 21

Fractions in descending order :

$$\frac{15}{13}, \frac{15}{16}, \frac{15}{17}, \frac{15}{19}, \frac{15}{21}$$

b. $\frac{11}{17}, 3\frac{1}{17}, \frac{19}{17}, 2\frac{2}{17}, \frac{65}{17}$

or $\frac{11}{17}, \frac{52}{17}, \frac{19}{17}, \frac{36}{17}, \frac{65}{17}$

Numerators in descending order :
65, 52, 36, 19, 11

Fractions in descending order :

$$\frac{65}{17}, \frac{52}{17}, \frac{36}{17}, \frac{19}{17}, \frac{11}{17}$$

or $\frac{65}{17}, 3\frac{1}{17}, 2\frac{2}{17}, \frac{19}{17}, \frac{11}{17}$

c. $\frac{2}{9}, \frac{8}{9}, \frac{6}{9}, \frac{7}{9}, 1\frac{4}{9}$

or $\frac{2}{9}, \frac{8}{9}, \frac{6}{9}, \frac{7}{9}, \frac{13}{9}$

Numerators in descending order :
13, 8, 7, 6, 2

Fractions in descending order :

$$\frac{13}{9}, \frac{8}{9}, \frac{7}{9}, \frac{6}{9}, \frac{2}{9}$$

or $1\frac{4}{9}, \frac{8}{9}, \frac{7}{9}, \frac{6}{9}, \frac{2}{9}$

10. a. $\frac{8}{18} = \frac{2 \times 2 \times 2}{2 \times 3 \times 3} = \frac{2 \times 2}{3 \times 3} = \frac{4}{9}$

b. $\frac{3}{9} = \frac{1}{3}$ c. $\frac{30}{75} = \frac{2 \times \cancel{3} \times \cancel{5}}{\cancel{3} \times \cancel{5} \times 5} = \frac{2}{5}$

d. $\frac{144}{80} = \frac{2 \times 2 \times 2 \times 2 \times 3 \times 3}{2 \times 2 \times 2 \times 2 \times 5} = \frac{3 \times 3}{5} = \frac{9}{5}$ e. $\frac{21}{14} = \frac{3 \times 7}{2 \times 7} = \frac{3}{2}$

11. a. $\frac{5}{20} = \frac{5}{2 \times 2 \times 5} = \frac{1}{4}$ So, $\frac{5}{20}$ in not in lowest terms.

b. $\frac{3}{11} = \frac{1 \times 3}{1 \times 11} = \frac{3}{11}$ So, $\frac{3}{11}$ in not in lowest terms.

c. $\frac{40}{41} = \frac{2 \times 2 \times 2 \times 5}{1 \times 41} = \frac{40}{41}$ So, $\frac{40}{41}$ in not in lowest terms.

d. $\frac{72}{61} = \frac{2 \times 2 \times 2 \times 3 \times 3}{1 \times 61} = \frac{72}{61}$ So, $\frac{72}{61}$ in not in lowest terms.

e. $\frac{25}{36} = \frac{5 \times 5}{2 \times 2 \times 3 \times 3} = \frac{25}{36}$ So, $\frac{25}{36}$ in not in lowest terms.

9. a. $\frac{5}{12}, \frac{5}{11}, \frac{5}{9}, \frac{5}{13}, \frac{5}{10}$

Denominator in descending order :
13, 12, 11, 10, 9

Fractions in ascending order :

$$\frac{5}{13}, \frac{5}{12}, \frac{5}{11}, \frac{5}{10}, \frac{5}{9}$$

b. $\frac{6}{7}, \frac{5}{7}, \frac{4}{7}, 2\frac{3}{7}, \frac{15}{7}$

Numerator in ascending order :
4, 5, 6, 15, 17

Fractions in ascending order :

$$\frac{4}{7}, \frac{5}{7}, \frac{6}{7}, \frac{15}{7}, \frac{17}{7}$$

or $\frac{4}{7}, \frac{5}{7}, \frac{6}{7}, \frac{15}{7}, 2\frac{3}{7}$

c. $\frac{14}{21}, \frac{17}{21}, \frac{12}{21}, \frac{22}{21}, 1\frac{2}{21}$

or $\frac{14}{21}, \frac{17}{21}, \frac{12}{21}, \frac{22}{21}, \frac{23}{21}$

Numerators in ascending order :
12, 14, 17, 22, 23

Fractions in ascending order :

or $\frac{12}{21}, \frac{14}{21}, \frac{17}{21}, \frac{22}{21}, \frac{23}{21}$

$$\frac{12}{21}, \frac{14}{21}, \frac{17}{21}, \frac{22}{21}, 1\frac{2}{21}$$

EXERCISE 7 C

1. a. $\frac{1}{7} + \frac{4}{7} = \frac{1+4}{7} = \frac{5}{7}$ b. $\frac{1}{15} + \frac{11}{15} = \frac{1+11}{15} = \frac{12}{15} = \frac{4}{5}$ c. $\frac{2}{13} + \frac{8}{13} = \frac{2+8}{13} = \frac{10}{13}$ d. $\frac{11}{24} + \frac{1}{24} = \frac{11+1}{24} = \frac{12}{24} = \frac{1}{2}$
2. a. $\frac{7}{8} + \frac{1}{8} = \frac{7+1}{8} = \frac{8}{8} = 1$ b. $\frac{3}{10} + \frac{7}{10} = \frac{3+7}{10} = \frac{10}{10} = 1$ c. $\frac{8}{15} + \frac{4}{15} = \frac{8+4}{15} = \frac{12}{15} = \frac{4}{5}$ d. $\frac{77}{100} + \frac{33}{100} = \frac{77+33}{100} = \frac{110}{100} = \frac{11}{10} = 1\frac{1}{10}$
3. a. $1\frac{1}{8} + 2\frac{3}{8} = \frac{9}{8} + \frac{19}{8} = \frac{9+19}{8} = \frac{28}{8} = \frac{7}{2} = 3\frac{1}{2}$ b. $\frac{1}{6} + 3\frac{5}{6} = \frac{1}{6} + \frac{23}{6} = \frac{1+23}{6} = \frac{24}{6} = 4$ c. $\frac{7}{8} + 5\frac{3}{8} = \frac{7}{8} + \frac{43}{8} = \frac{7+43}{8} = \frac{50}{8} = \frac{25}{4} = 6\frac{1}{4}$ d. $\frac{11}{80} + 4\frac{19}{80} = \frac{11}{80} + \frac{339}{80} = \frac{11+339}{80} = \frac{350}{80} = \frac{35}{8} = 4\frac{3}{8}$
4. a. $\frac{7}{15} - \frac{1}{15} = \frac{7-1}{15} = \frac{6}{15} = \frac{2}{5}$ b. $\frac{23}{75} - \frac{11}{75} = \frac{23-11}{75} = \frac{12}{75} = \frac{4}{25}$ c. $3\frac{2}{9} - \frac{5}{9} = \frac{29}{9} - \frac{5}{9} = \frac{29-5}{9} = \frac{24}{9} = \frac{8}{3} = 2\frac{2}{3}$ d. $10\frac{7}{18} - 5\frac{5}{18} = \frac{187}{18} - \frac{95}{18} = \frac{187-95}{18} = \frac{92}{18} = \frac{46}{9} = 5\frac{1}{9}$

EXERCISE 7 D

1. a. $8 = 2 \times 2 \times 2$
 $7 = 2 \times 2$
 The LCM of 8 and 4
 is $2 \times 2 \times 2 = 8$
 $\frac{1}{8} + \frac{1}{4} = \frac{1}{8} + \frac{1 \times 2}{4 \times 2}$
 $= \frac{1}{8} + \frac{2}{8} = \frac{1+2}{8} = \frac{3}{8}$
- b. $9 = 3 \times 3$
 $3 = 1 \times 3$
 The LCM of 9 and 3
 is $3 \times 3 = 9$
 $\frac{1}{9} + \frac{2}{3} = \frac{1}{9} + \frac{2 \times 3}{3 \times 3}$
 $= \frac{1}{9} + \frac{6}{9} = \frac{1+6}{9} = \frac{7}{9}$
- c. $2 = 1 \times 2$
 $8 = 2 \times 2 \times 2$
 The LCM of 2 and 8
 is $2 \times 2 \times 2 = 8$
 $\frac{1 \times 4}{2 \times 4} + \frac{3}{8} = \frac{4}{8} + \frac{3}{8}$
 $= \frac{4+3}{8} = \frac{7}{8}$
- d. $12 = 2 \times 2 \times 3$
 $6 = 2 \times 3$
 The LCM of 12 and 6
 is $2 \times 2 \times 3 = 12$
 $\frac{7}{12} + \frac{17}{6} = \frac{7}{12} + \frac{17 \times 2}{6 \times 2}$
 $= \frac{7}{12} + \frac{34}{12} = \frac{7+34}{12} = \frac{41}{12}$
- e. $6 = 2 \times 3$
 $9 = 3 \times 3$
 The LCM of 6 and 9
 is $2 \times 3 \times 3 = 18$
 $\frac{5}{6} + \frac{16}{9} = \frac{5 \times 3}{6 \times 3} + \frac{16 \times 2}{9 \times 2}$
 $= \frac{15}{18} + \frac{32}{18} = \frac{15+32}{18} = \frac{47}{18}$

2. a. $\frac{3}{5} + \frac{1}{10}$ b. $\frac{1}{2} + \frac{1}{4}$ c. $\frac{3}{8} + \frac{1}{4}$ d. $\frac{3}{10} + \frac{2}{5}$

LCM of 5 and 10 is 10 LCM of 2 and 4 is 4 LCM of 8 and 4 is 8 LCM of 10 and 5 is 10

$$\frac{3}{5} + \frac{1}{10} = \frac{2 \times 3 + 1 \times 1}{10} = \frac{6+1}{10} = \frac{7}{10}$$

$$\frac{1}{2} + \frac{1}{4} = \frac{2 \times 1 + 1 \times 1}{4} = \frac{2+1}{4} = \frac{3}{4}$$

$$\frac{3}{8} + \frac{1}{4} = \frac{1 \times 3 + 2 \times 1}{8} = \frac{3+2}{8} = \frac{5}{8}$$

$$\frac{3}{10} + \frac{2}{5} = \frac{1 \times 3 + 2 \times 2}{10} = \frac{3+4}{10} = \frac{7}{10}$$

3. a. $\frac{1}{6} + \frac{1}{3}$ b. $\frac{1}{8} + \frac{6}{16}$ c. $\frac{1}{2} + \frac{5}{8}$ d. $\frac{2}{5} + \frac{9}{10}$

LCM of 6 and 3 is 6 LCM of 8 and 16 is 16 LCM of 2 and 8 is 8 LCM of 5 and 10 is 10

$$\frac{1}{6} + \frac{1}{3} = \frac{1 \times 1 + 2 \times 1}{6} = \frac{1+2}{6} = \frac{3}{6} = \frac{1}{2}$$

$$\frac{1}{8} + \frac{6}{16} = \frac{2 \times 1 + 1 \times 6}{16} = \frac{2+6}{16} = \frac{8}{16} = \frac{1}{2}$$

$$\frac{1}{2} + \frac{5}{8} = \frac{4 \times 1 + 1 \times 5}{8} = \frac{4+5}{8} = \frac{9}{8}$$

$$\frac{2}{5} + \frac{9}{10} = \frac{2 \times 2 + 1 \times 9}{10} = \frac{4+9}{10} = \frac{13}{10}$$

4. a. $\frac{8}{9} + \frac{5}{12}$ b. $\frac{1}{2} + \frac{7}{8}$ c. $\frac{9}{10} + \frac{13}{15}$ d. $\frac{2}{12} + \frac{3}{4}$

LCM of 9 and 12 is 36 LCM of 2 and 8 is 8 LCM of 10 and 15 is 30 LCM of 12 and 4 is 12

$$\frac{8}{9} + \frac{5}{12} = \frac{4 \times 8 + 3 \times 5}{36} = \frac{32+15}{36} = \frac{47}{36}$$

$$\frac{1}{2} + \frac{7}{8} = \frac{4 \times 1 + 1 \times 7}{8} = \frac{4+7}{8} = \frac{11}{8}$$

$$\frac{9}{10} + \frac{13}{15} = \frac{3 \times 9 + 2 \times 13}{30} = \frac{27+26}{30} = \frac{53}{30}$$

$$\frac{2}{12} + \frac{3}{4} = \frac{1 \times 2 + 3 \times 3}{12} = \frac{2+9}{12} = \frac{11}{12}$$

5. a. $\frac{1}{3} + \frac{1}{2} + \frac{1}{12}$ b. $\frac{3}{5} + \frac{7}{10} + \frac{1}{2}$ c. $\frac{2}{5} + \frac{4}{15} + \frac{3}{10}$ d. $\frac{5}{14} + \frac{19}{21} + \frac{47}{84}$

LCM of 3, 2 and 12 is 12 LCM of 5, 10 and 2 is 10 LCM of 5, 15 and 10 is 30 LCM of 14, 21 and 84 is 84

$$\frac{1}{3} + \frac{1}{2} + \frac{1}{12} = \frac{4 \times 1 + 6 \times 1 + 1 \times 1}{12} = \frac{4+6+1}{12} = \frac{11}{12}$$

$$\frac{3}{5} + \frac{7}{10} + \frac{1}{2} = \frac{2 \times 3 + 1 \times 7 + 5 \times 1}{10} = \frac{6+7+5}{10} = \frac{18}{10} = \frac{9}{5}$$

$$\frac{2}{5} + \frac{4}{15} + \frac{3}{10} = \frac{6 \times 2 + 2 \times 4 + 3 \times 3}{30} = \frac{12+8+9}{30} = \frac{29}{30}$$

$$\frac{5}{14} + \frac{19}{21} + \frac{47}{84} = \frac{6 \times 5 + 4 \times 19 + 1 \times 47}{84} = \frac{30+76+47}{84} = \frac{153}{84} = \frac{51}{28}$$

6. a. $\frac{2}{3} + \frac{1}{6} + \frac{4}{9}$
 LCM of 3, 6 and 9 is 18
 $\frac{2}{3} + \frac{1}{6} + \frac{4}{9}$
 $= \frac{6 \times 2 + 3 \times 1 + 2 \times 4}{18}$
 $= \frac{12 + 3 + 8}{18}$
 $= \frac{23}{18}$

b. $\frac{7}{16} + \frac{5}{8} + \frac{1}{2}$
 LCM of 16, 8 and 2 is 16
 $\frac{7}{16} + \frac{5}{8} + \frac{1}{2}$
 $= \frac{1 \times 7 + 2 \times 5 + 8 \times 1}{16}$
 $= \frac{7 + 10 + 8}{16}$
 $= \frac{25}{16}$

c. $\frac{7}{10} + \frac{3}{5} + \frac{9}{10}$
 LCM of 10, 5 and 10 is 10
 $\frac{7}{10} + \frac{3}{5} + \frac{9}{10}$
 $= \frac{1 \times 7 + 2 \times 3 + 1 \times 9}{10}$
 $= \frac{7 + 6 + 9}{10}$
 $= \frac{22}{10} = \frac{11}{5}$

d. $\frac{7}{9} + 4 + \frac{5}{6}$
 or $\frac{7}{9} + \frac{4}{1} + \frac{5}{6}$
 LCM of 9, 1 and 6 is 18
 $\frac{7}{9} + \frac{4}{1} + \frac{5}{6}$
 $= \frac{2 \times 7 + 18 \times 4 + 3 \times 5}{18}$
 $= \frac{14 + 72 + 15}{18} = \frac{101}{18}$

EXERCISE 7 E

1. a. $5 + 3\frac{1}{2}$
 $= \frac{5}{1} + \frac{7}{2}$
 LCM of 1 and 2 is 2
 $\frac{5}{1} + \frac{7}{2}$
 $= \frac{2 \times 5 + 1 \times 7}{2}$
 $= \frac{10 + 7}{2}$
 $= \frac{17}{2} = 8\frac{1}{2}$

b. $3\frac{3}{7} + 2\frac{2}{7}$
 $= \frac{24}{7} + \frac{16}{7}$
 $= \frac{24 + 16}{7}$
 $= \frac{40}{7} = 5\frac{5}{7}$

c. $1\frac{1}{4} + 2\frac{1}{4}$
 $= \frac{5}{4} + \frac{9}{4}$
 $= \frac{5 + 9}{4} = \frac{14}{4}$
 $= \frac{7}{2} = 3\frac{1}{2}$

d. $1\frac{3}{7} + 2\frac{2}{3}$
 $= \frac{7}{4} + \frac{8}{3}$
 LCM of 4 and 3 is 12
 $\frac{7}{4} + \frac{8}{3}$
 $= \frac{3 \times 7 + 4 \times 8}{12}$
 $= \frac{21 + 32}{12}$
 $= \frac{53}{12} = 4\frac{5}{12}$

2. a. $1\frac{3}{8} + \frac{2}{7}$
 $= \frac{11}{8} + \frac{2}{7}$
 LCM of 8 and 7 is 56
 $\frac{11}{8} + \frac{2}{7}$
 $= \frac{7 \times 11 + 8 \times 2}{56} = \frac{77 + 16}{56}$
 $= \frac{93}{56} = 1\frac{37}{56}$

b. $1\frac{3}{10} + 4\frac{1}{2}$
 $= \frac{13}{10} + \frac{9}{2}$
 LCM of 10 and 3 is 10
 $\frac{13}{10} + \frac{9}{2}$
 $= \frac{1 \times 13 + 5 \times 9}{10} = \frac{13 + 45}{10}$
 $= \frac{58}{10} = \frac{29}{5} = 5\frac{4}{5}$

c. $2\frac{3}{4} + 2\frac{2}{3} = \frac{11}{4} + \frac{8}{3}$
 LCM of 4 and 3 is 12
 $\frac{11}{4} + \frac{8}{3}$
 $= \frac{3 \times 11 + 4 \times 8}{12} = \frac{33 + 32}{12}$
 $= \frac{65}{12} = 5\frac{5}{12}$

d. $3\frac{2}{5} + 2\frac{1}{2} = \frac{17}{5} + \frac{5}{2}$
 LCM of 5 and 2 is 10
 $\frac{17}{5} + \frac{5}{2}$
 $= \frac{2 \times 17 + 5 \times 5}{10} = \frac{34 + 25}{10}$
 $= \frac{59}{10} = 5\frac{9}{10}$

$$3. \text{ a. } 5 + 3\frac{2}{3} + 2\frac{1}{9}$$

$$= \frac{5}{1} + \frac{11}{3} + \frac{19}{9}$$

LCM of 1, 3 and 9 is 9

$$\frac{5}{1} + \frac{11}{3} + \frac{19}{9}$$

$$= \frac{9 \times 5 + 3 \times 11 + 1 \times 19}{9}$$

$$= \frac{45 + 33 + 19}{9} = \frac{97}{9} = 10\frac{7}{9}$$

$$\text{b. } 3 + \frac{3}{4} + 2\frac{5}{8}$$

$$= \frac{3}{1} + \frac{3}{4} + \frac{21}{8}$$

LCM of 1, 4 and 8 is 8

$$\frac{3}{1} + \frac{3}{4} + \frac{21}{8}$$

$$= \frac{8 \times 3 + 2 \times 3 + 1 \times 21}{8}$$

$$= \frac{24 + 6 + 21}{8} = \frac{51}{8} = 6\frac{3}{8}$$

$$\text{c. } 1\frac{1}{7} + 2\frac{1}{14} + 3\frac{1}{28}$$

$$= \frac{8}{7} + \frac{29}{14} + \frac{85}{28}$$

LCM of 7, 14 and 28 is 28

$$\frac{8}{7} + \frac{29}{14} + \frac{85}{28}$$

$$= \frac{4 \times 8 + 2 \times 29 + 1 \times 85}{28}$$

$$= \frac{32 + 58 + 85}{28} = \frac{175}{28} = \frac{25}{4} = 6\frac{1}{4}$$

$$\text{d. } \frac{14}{9} + 1\frac{4}{9} + \frac{25}{18}$$

$$= \frac{14}{9} + \frac{13}{9} + \frac{25}{18}$$

LCM of 9, 9 and 18 is 18

$$\frac{14}{9} + \frac{13}{9} + \frac{25}{18}$$

$$= \frac{2 \times 14 + 2 \times 13 + 1 \times 25}{18}$$

$$= \frac{28 + 26 + 25}{18} = \frac{79}{18} = 4\frac{7}{18}$$

EXERCISE 7 F

$$1. \text{ a. } \frac{1}{2} - \frac{1}{3}$$

LCM 2 and 3 is 6

$$\frac{1}{2} - \frac{1}{3}$$

$$= \frac{1 \times 3}{2 \times 3} - \frac{1 \times 2}{3 \times 2}$$

$$= \frac{3}{6} - \frac{2}{6} = \frac{3-2}{6} = \frac{1}{6}$$

$$\text{b. } \frac{3}{4} - \frac{1}{2}$$

LCM 4 and 2 is 4

$$\frac{3}{4} - \frac{1}{2}$$

$$= \frac{3}{4} - \frac{1 \times 2}{2 \times 2}$$

$$= \frac{3}{4} - \frac{2}{4} = \frac{3-2}{4} = \frac{1}{4}$$

$$\text{c. } \frac{3}{4} - \frac{2}{3}$$

LCM 4 and 3 is 12

$$\frac{3}{4} - \frac{2}{3}$$

$$= \frac{3 \times 3}{4 \times 3} - \frac{2 \times 4}{3 \times 4}$$

$$= \frac{9}{12} - \frac{8}{12} = \frac{9-8}{12} = \frac{1}{12}$$

$$\text{d. } 2\frac{2}{3} - 1\frac{1}{4} = \frac{8}{3} - \frac{5}{4}$$

LCM of 3 and 4 is 12

$$\frac{8}{3} - \frac{5}{4} = \frac{8 \times 4}{3 \times 4} - \frac{5 \times 3}{4 \times 3}$$

$$= \frac{32}{12} - \frac{15}{12} = \frac{32-15}{12}$$

$$= \frac{17}{12} = 1\frac{5}{12}$$

$$\text{e. } 5\frac{5}{6} - 2\frac{1}{3} = \frac{35}{6} - \frac{7}{3}$$

LCM of 6 and 3 is 6

$$\frac{35}{6} - \frac{7}{3} = \frac{35}{6} - \frac{7 \times 2}{3 \times 2}$$

$$= \frac{35}{6} - \frac{14}{6} = \frac{35-14}{6}$$

$$= \frac{21}{6} = \frac{7}{2} = 3\frac{1}{2}$$

2. a. $\frac{9}{14} - \frac{2}{7}$

LCM of 14 and 7 is 14

$$\begin{aligned} & \frac{9}{14} - \frac{2}{7} \\ &= \frac{1 \times 9 - 2 \times 2}{14} \\ &= \frac{9 - 4}{14} = \frac{5}{14} \end{aligned}$$

b. $\frac{11}{18} - \frac{7}{36}$

LCM of 18 and 36 is 36

$$\begin{aligned} & \frac{11}{18} - \frac{7}{36} \\ &= \frac{2 \times 11 - 1 \times 7}{36} \\ &= \frac{22 - 7}{36} = \frac{15}{36} \end{aligned}$$

c. $\frac{13}{15} - \frac{7}{30}$

LCM of 15 and 30 is 30

$$\begin{aligned} & \frac{13}{15} - \frac{7}{30} \\ &= \frac{2 \times 13 - 1 \times 7}{30} \\ &= \frac{26 - 7}{30} = \frac{19}{30} \end{aligned}$$

d. $\frac{8}{11} - \frac{3}{10}$

LCM of 11 and 10 is 110

$$\begin{aligned} & \frac{8}{11} - \frac{3}{10} \\ &= \frac{10 \times 8 - 11 \times 3}{110} \\ &= \frac{80 - 33}{110} = \frac{47}{110} \end{aligned}$$

3. a. $7 - 1\frac{3}{6}$

$$= \frac{7}{1} - \frac{9}{6}$$

LCM of 1 and 6 is 6

$$\begin{aligned} & \frac{7}{1} - \frac{9}{6} \\ &= \frac{6 \times 7 - 1 \times 9}{6} \\ &= \frac{42 - 9}{6} = \frac{33}{6} \\ &= \frac{11}{2} = 5\frac{1}{2} \end{aligned}$$

b. $8 - \frac{2}{3}$

$$= \frac{8}{1} - \frac{2}{3}$$

LCM of 1 and 3 is 3

$$\begin{aligned} & \frac{8}{1} - \frac{2}{3} \\ &= \frac{3 \times 8 - 1 \times 2}{3} \\ &= \frac{24 - 1}{3} \\ &= \frac{22}{3} = 7\frac{1}{3} \end{aligned}$$

c. $5 - 4\frac{1}{3}$

$$= \frac{5}{1} - \frac{13}{3}$$

LCM of 1 and 3 is 3

$$\begin{aligned} & \frac{5}{1} - \frac{13}{3} \\ &= \frac{3 \times 5 - 1 \times 13}{3} \\ &= \frac{15 - 13}{3} = \frac{2}{3} \end{aligned}$$

d. $11 - 5\frac{5}{8}$

$$= \frac{11}{1} - \frac{45}{8}$$

LCM of 1 and 8 is 8

$$\begin{aligned} & \frac{11}{1} - \frac{45}{8} \\ &= \frac{8 \times 11 - 1 \times 45}{8} \\ &= \frac{88 - 45}{8} \\ &= \frac{43}{8} = 5\frac{3}{8} \end{aligned}$$

4. a. $11 - 8\frac{4}{5}$

$$= \frac{11}{1} - \frac{44}{5}$$

LCM of 1 and 5 is 5

$$\begin{aligned} & \frac{11}{1} - \frac{44}{5} \\ &= \frac{5 \times 11 - 1 \times 44}{5} \\ &= \frac{55 - 44}{5} \\ &= \frac{11}{5} = 2\frac{1}{5} \end{aligned}$$

b. $16 - 10\frac{12}{13}$

$$= \frac{16}{1} - \frac{142}{13}$$

LCM of 1 and 13 is 13

$$\begin{aligned} & \frac{16}{1} - \frac{142}{13} \\ &= \frac{13 \times 16 - 1 \times 142}{13} \\ &= \frac{208 - 142}{13} \\ &= \frac{66}{13} = 5\frac{1}{13} \end{aligned}$$

c. $17 - 16\frac{5}{8}$

$$= \frac{17}{1} - \frac{133}{8}$$

LCM of 1 and 8 is 8

$$\begin{aligned} & \frac{17}{1} - \frac{133}{8} \\ &= \frac{8 \times 17 - 1 \times 133}{8} \\ &= \frac{136 - 133}{8} \\ &= \frac{3}{8} \end{aligned}$$

d. $14 - 6\frac{9}{11}$

$$= \frac{14}{1} - \frac{75}{11}$$

LCM of 1 and 11 is 11

$$\begin{aligned} & \frac{14}{1} - \frac{75}{11} \\ &= \frac{11 \times 14 - 1 \times 75}{11} \\ &= \frac{154 - 75}{11} \\ &= \frac{79}{11} = 7\frac{2}{11} \end{aligned}$$

$$\begin{aligned}
 5. \quad a. \quad & 9\frac{12}{17} - 6\frac{5}{17} \\
 & = \frac{165}{17} - \frac{107}{17} \\
 & = \frac{165-107}{17} \\
 & = \frac{58}{17} = 3\frac{7}{17}
 \end{aligned}$$

$$\begin{aligned}
 b. \quad & 8\frac{3}{9} - 6\frac{4}{5} \\
 & = \frac{75}{9} - \frac{34}{5} \\
 & \text{LCM of 9 and} \\
 & \text{5 is 45} \\
 & = \frac{75}{9} - \frac{34}{5} \\
 & = \frac{5 \times 75 - 9 \times 34}{45} \\
 & = \frac{375 - 306}{45} = \frac{69}{45} \\
 & = \frac{23}{15} = 1\frac{8}{15}
 \end{aligned}$$

$$\begin{aligned}
 c. \quad & 3\frac{7}{12} - 2\frac{4}{9} \\
 & = \frac{43}{12} - \frac{22}{9} \\
 & \text{LCM of 12 and} \\
 & \text{9 is 36} \\
 & = \frac{43}{12} - \frac{22}{9} \\
 & = \frac{3 \times 43 - 4 \times 22}{36} \\
 & = \frac{129 - 88}{36} \\
 & = \frac{41}{36} = 1\frac{5}{36}
 \end{aligned}$$

$$\begin{aligned}
 d. \quad & 7\frac{3}{4} - 3 \\
 & = \frac{31}{4} - \frac{3}{1} \\
 & \text{LCM of 4 and} \\
 & \text{1 is 4} \\
 & = \frac{31}{4} - \frac{3}{1} \\
 & = \frac{1 \times 31 - 4 \times 3}{4} \\
 & = \frac{31 - 12}{4} \\
 & = \frac{19}{4} = 4\frac{3}{4}
 \end{aligned}$$

EXERCISE 7 G

$$\begin{aligned}
 1. \quad a. \quad & 3 + \frac{7}{15} - \frac{2}{15} \\
 & = \frac{3}{1} + \frac{7}{15} - \frac{2}{15} \\
 & \text{LCM of 1, 15 and} \\
 & \text{15 is 15} \\
 & = \frac{3}{1} + \frac{7}{15} - \frac{2}{15} \\
 & = \frac{15 \times 3 + 1 \times 7 - 1 \times 2}{15} \\
 & = \frac{45 + 7 - 2}{15} = \frac{50}{15} \\
 & = \frac{10}{3} = 3\frac{1}{3}
 \end{aligned}$$

$$\begin{aligned}
 1. \quad b. \quad & \frac{3}{7} + \frac{5}{7} - \frac{4}{7} \\
 & = \frac{3+5-4}{7} \\
 & = \frac{8-4}{7} = \frac{4}{7}
 \end{aligned}$$

$$\begin{aligned}
 1. \quad c. \quad & 7\frac{3}{4} + 2\frac{1}{4} - 4 \\
 & = \frac{31}{4} + \frac{9}{4} - \frac{4}{1} \\
 & \text{LCM of 4, 4 and} \\
 & \text{1 is 4} \\
 & = \frac{31}{4} + \frac{9}{4} - \frac{4}{1} \\
 & = \frac{1 \times 31 + 1 \times 9 - 4 \times 4}{4} \\
 & = \frac{31 + 9 - 16}{4} \\
 & = \frac{40 - 16}{4} = \frac{24}{4} = 6
 \end{aligned}$$

$$\begin{aligned}
 1. \quad d. \quad & 3\frac{7}{12} + 1\frac{7}{12} - \frac{5}{12} \\
 & = \frac{43}{12} + \frac{19}{12} - \frac{5}{12} \\
 & = \frac{43+19-5}{12} \\
 & = \frac{62-5}{12} = \frac{57}{12} \\
 & = \frac{19}{4} = 4\frac{3}{4}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad a. \quad & 4\frac{5}{21} - 5\frac{1}{14} + 2 \\
 & = \frac{89}{21} - \frac{71}{14} + \frac{2}{1} \\
 & \text{LCM of 21, 14 and} \\
 & \text{1 is 42} \\
 & = \frac{89}{21} - \frac{71}{14} + \frac{2}{1} \\
 & = \frac{2 \times 89 - 3 \times 71 + 42 \times 2}{42} \\
 & = \frac{178 - 213 + 84}{42} \\
 & = \frac{262 - 213}{42} = \frac{49}{42} \\
 & = \frac{7}{6} = 1\frac{1}{6}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad b. \quad & 5 - \frac{1}{6} + 2\frac{1}{3} \\
 & = \frac{5}{1} - \frac{1}{6} + \frac{7}{3} \\
 & \text{LCM of 1, 6 and} \\
 & \text{3 is 6} \\
 & = \frac{5}{1} - \frac{1}{6} + \frac{7}{3} \\
 & = \frac{6 \times 5 - 1 \times 1 + 2 \times 7}{6} \\
 & = \frac{30 - 1 + 14}{6} \\
 & = \frac{44 - 1}{6} = \frac{43}{6} \\
 & = 7\frac{1}{6}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad c. \quad & 2\frac{2}{5} - 1\frac{3}{10} - \frac{4}{15} \\
 & = \frac{15}{5} - \frac{13}{10} - \frac{4}{15} \\
 & \text{LCM of 5, 10 and} \\
 & \text{15 is 30} \\
 & = \frac{12}{5} - \frac{13}{10} - \frac{4}{15} \\
 & = \frac{6 \times 12 - 3 \times 13 - 2 \times 4}{30} \\
 & = \frac{72 - 39 - 8}{30} \\
 & = \frac{72 - 47}{30} = \frac{25}{30} = \frac{5}{6}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad d. \quad & \frac{1}{2} - \frac{3}{16} + \frac{1}{4} \\
 & \text{LCM of 2, 16 and} \\
 & \text{4 is 16} \\
 & \frac{1}{2} - \frac{3}{16} + \frac{1}{4} \\
 & = \frac{8 \times 1 - 1 \times 3 + 4 \times 1}{16} \\
 & = \frac{8 - 3 + 4}{16} \\
 & = \frac{12 - 3}{16} = \frac{9}{16}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad a. \quad & 4\frac{6}{7} - \frac{8}{21} - 1 \\
 & = \frac{34}{7} - \frac{8}{21} - \frac{1}{1} \\
 & \text{LCM of 7, 21 and} \\
 & \text{1 is 21} \\
 & = \frac{34}{7} - \frac{8}{21} - \frac{1}{1} \\
 & = \frac{3 \times 34 - 1 \times 8 - 21 \times 1}{21} \\
 & = \frac{102 - 8 - 21}{21} \\
 & = \frac{102 - 29}{21} = \frac{73}{21} = 3\frac{10}{21}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad b. \quad & 10 - \frac{3}{4} - \frac{5}{8} \\
 & = \frac{10}{1} - \frac{3}{4} - \frac{5}{8} \\
 & \text{LCM of 1, 4 and} \\
 & \text{8 is 8} \\
 & = \frac{10}{1} - \frac{3}{4} - \frac{5}{8} \\
 & = \frac{8 \times 10 - 2 \times 3 - 1 \times 5}{8} \\
 & = \frac{80 - 6 - 5}{8} \\
 & = \frac{80 - 11}{8} = \frac{69}{8} = 8\frac{5}{8}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad c. \quad & 6\frac{1}{3} - 2\frac{1}{9} + 1\frac{5}{12} \\
 & = \frac{19}{3} - \frac{19}{9} + \frac{17}{12} \\
 & \text{LCM of 3, 9 and} \\
 & \text{12 is 36} \\
 & = \frac{19}{3} - \frac{19}{9} + \frac{17}{12} \\
 & = \frac{12 \times 19 - 4 \times 19 + 3 \times 17}{36} \\
 & = \frac{228 - 76 + 51}{36} \\
 & = \frac{279 - 76}{36} = \frac{203}{36} = 5\frac{23}{36}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad d. \quad & 11\frac{1}{2} - \frac{1}{4} - 3\frac{1}{8} \\
 & = \frac{23}{2} - \frac{1}{4} - \frac{25}{8} \\
 & \text{LCM of 2, 4 and} \\
 & \text{8 is 8} \\
 & = \frac{23}{2} - \frac{1}{4} - \frac{25}{8} \\
 & = \frac{4 \times 23 - 2 \times 21 - 1 \times 25}{8} \\
 & = \frac{92 - 42 - 25}{8} \\
 & = \frac{92 - 67}{8} = \frac{25}{8} = 3\frac{1}{8}
 \end{aligned}$$

EXERCISE 7H

1. One piece of cheese weight = $\frac{7}{8}$ of a kg = $\frac{7}{8}$ kg

Other piece of cheese weight = $\frac{6}{8}$ of a kg = $\frac{6}{8}$ kg

$$\text{Total weight} = \frac{7}{8} \text{ kg} + \frac{6}{8} \text{ kg} = \frac{7+6}{8} = \frac{13}{8} \text{ kg} = 1\frac{5}{8} \text{ kg}$$

Two pieces of cheese weight is $1\frac{5}{8}$ kg.

2. Length of blue ribbon = $2\frac{1}{3}$ m

Length of red ribbon = $3\frac{1}{2}$ m

$$\text{Total length of blue and red ribbons} = 2\frac{1}{3} \text{ m} + 3\frac{1}{2} \text{ m} = \frac{7}{3} \text{ m} + \frac{7}{2} \text{ m}$$

$$= \frac{2 \times 7 + 3 \times 7}{6} = \frac{14 + 21}{6} \text{ m} = \frac{35}{6} \text{ m} = 5\frac{5}{6} \text{ m}$$

Seema has $5\frac{5}{6}$ m of ribbon.

3. Geeta take to finish her maths homework = $1\frac{1}{5}$ hrs = $\frac{6}{5}$ hrs

Geeta take to finish her science homework = $\left(\frac{6}{5} - \frac{6}{10}\right)$ hrs
 $= \frac{2 \times 6 - 1 \times 7}{10} = \frac{12 - 7}{10}$
 $= \frac{5}{10} = \frac{1}{2}$ hour

She took time to complete both the home works = $\left(\frac{6}{5} + \frac{1}{2}\right)$ hrs
 $= \frac{12 + 5}{10} = \frac{17}{10} = 1\frac{7}{10}$ hrs

Geeta take $1\frac{7}{10}$ hrs to complete her homework.

4. Total length of thread = $20\frac{3}{4}$ m = $\frac{83}{4}$ m

(a) Vipin used = $8\frac{1}{2}$ m = $\frac{17}{2}$ m

Left thread = $\left(\frac{83}{4} - \frac{17}{2}\right)$ m
 $= \frac{83 - 34}{4} = \frac{49}{4} = 12\frac{1}{4}$ m

(b) He later used thread = $7\frac{3}{8}$ m = $\frac{59}{8}$ m

Now, left thread = $\left(\frac{49}{4} - \frac{59}{8}\right)$ m
 $= \frac{98 - 59}{8} = \frac{39}{8}$ m $4\frac{7}{8}$ m

(a) left thread = $12\frac{1}{4}$ m

(b) left thread = $4\frac{7}{8}$ m

5. Mohit bought flour = $6\frac{1}{2}$ kg = $\frac{13}{2}$ kg

Teena bought flour = $\frac{15}{4}$ kg

(a) They buy altogether = $\left(\frac{13}{2} + \frac{15}{4}\right)$ kg
 $= \frac{26 + 15}{4} = \frac{41}{4}$ kg = $10\frac{1}{4}$ kg

(b) $\frac{13}{2} > \frac{15}{4}$

$13 \times 4 = 52$ $15 \times 2 = 30$ $\therefore \frac{13}{2} > \frac{15}{4}$

$\frac{13}{2} - \frac{15}{4} = \frac{26 - 15}{4} = \frac{11}{4} = 2\frac{3}{4}$ kg

So, Mohit bought $2\frac{3}{4}$ kg more flour.

6. (a) Petrol used on Monday = $3\frac{1}{3}l = \frac{10}{3}l$

Petrol used on Tuesday = $4\frac{1}{2}l = \frac{9}{2}l$

Petrol used on these two days = $\left(\frac{10}{3} + \frac{9}{2}\right)l = \frac{20+27}{6} = \frac{47}{6} = 7\frac{5}{6}l$

(b) Total quantity of petrol filled = $10l$.

Left petrol at the end of Tuesday = $\left(10 - \frac{47}{6}\right) = \frac{10}{1} - \frac{47}{6}$
 $= \frac{60-47}{6} = \frac{13}{6} = 2\frac{1}{6}l$

7. (a) Total length of cloth did the family by in all = $3\frac{2}{5}m + 3\frac{1}{3}m + 2\frac{5}{8}m$
 $= \left(\frac{17}{5} + \frac{10}{3} + \frac{21}{8}\right)m$
 $= \frac{24 \times 17 + 40 \times 10 + 15 \times 21}{120}$
 $= \frac{408 + 400 + 315}{120} = \frac{1123}{120} = 9\frac{43}{120}m$

(b) Total length of cloth roll = $20m$

Used cloth = $\frac{1123}{120}m$

Length of cloth was left in roll = $\left(20 - \frac{1123}{120}\right)m = \left(\frac{20}{1} - \frac{1123}{120}\right)m$
 $= \frac{120 \times 20 - 1 \times 1123}{120} = \frac{2400 - 1123}{120}$
 $= \frac{1277}{120}m = 10\frac{77}{120}m$

Chapter 8 More on Fractions

EXERCISE 8 A

1. a. $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{1+1+1+1}{5} = \frac{4}{5}$

b. $\frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} = \frac{1+1+1+1+1+1+1+1+1}{10} = \frac{9}{10}$

c. 7 times $\frac{1}{12} = 7 \times \frac{1}{12} = \frac{7 \times 1}{12} = \frac{7}{12}$

d. 5 times $\frac{1}{6} = 5 \times \frac{1}{6} = \frac{5 \times 1}{6} = \frac{5}{6}$

e. 5 times $3\frac{1}{8} = 5 \times \frac{25}{8} = \frac{5 \times 25}{8} = \frac{125}{8}$

2. a. 7 by $\frac{1}{2} = 7 \times \frac{1}{2} = \frac{7 \times 1}{2} = \frac{7}{2} = 3\frac{1}{2}$

b. 8 by $\frac{4}{5} = 8 \times \frac{4}{5} = \frac{8 \times 4}{5} = \frac{32}{5} = 6\frac{2}{5}$

- c. 14 by $\frac{2}{7} = 14 \times \frac{2}{7} = \frac{2\cancel{14} \times 2}{\cancel{7}_1} = 2 \times 2 = 4$
- d. 5 by $\frac{2}{3} = 5 \times \frac{2}{3} = \frac{5 \times 2}{3} = \frac{10}{3} = 3\frac{1}{3}$
3. a. $\frac{1}{20}$ by $20 = \frac{1}{20} \times 20 = \frac{1 \times \cancel{20}^1}{\cancel{20}_1} = 1 \times 1 = 1$
- b. $\frac{3}{4}$ by $32 = \frac{3}{4} \times 32 = \frac{3 \times \cancel{32}^8}{\cancel{4}_1} = 3 \times 8 = 24$
- c. $\frac{1}{8}$ by $4 = \frac{1}{8} \times 4 = \frac{1 \times \cancel{4}^1}{\cancel{8}_2} = \frac{1}{2}$
- d. $9 \times \frac{5}{6} = \frac{\cancel{9} \times 5}{\cancel{6}_2} = \frac{3 \times 5}{2} = \frac{15}{2} = 7\frac{1}{2}$
4. a. $10 \times \frac{4}{5} = \frac{\cancel{10} \times 4}{\cancel{5}_1} = 2 \times 4 = 8$
- b. $22 \times \frac{1}{33} = \frac{\cancel{22} \times 1}{\cancel{33}_3} = \frac{2 \times 1}{3} = \frac{2}{3}$
- c. $16 \times \frac{7}{80} = \frac{\cancel{16} \times 7}{\cancel{80}_5} = \frac{1 \times 7}{5} = \frac{7}{5} = 1\frac{2}{5}$
- d. $72 \times \frac{5}{12} = \frac{\cancel{72} \times 5}{\cancel{12}_1} = 6 \times 5 = 30$
5. a. $\frac{9}{18} \times 6 = \frac{\cancel{9} \times \cancel{6}^1}{\cancel{18}_3} = 3$
- b. $\frac{7}{30} \times 20 = \frac{7 \times \cancel{20}^2}{\cancel{30}_3} = \frac{7 \times 2}{3} = \frac{14}{3} = 4\frac{2}{3}$
- c. $\frac{25}{55} \times 11 = \frac{\cancel{25} \times \cancel{11}^1}{\cancel{55}_5} = 5$
- d. $\frac{10}{19} \times 95 = \frac{10 \times \cancel{95}^5}{\cancel{19}_1} = 10 \times 5 = 50$
6. a. $1 \times \frac{18}{23} = \frac{1 \times 18}{23} = \frac{18}{23}$
- b. $\frac{52}{67} \times 1 = \frac{52 \times 1}{67} = \frac{52}{67}$
- c. $\frac{101}{151} \times 0 = \frac{101 \times 0}{151} = \frac{0}{151} = 0$
- d. $0 \times \frac{99}{100} = \frac{0 \times 99}{100} = \frac{0}{100} = 0$

EXERCISE 8 B

1. a. $\frac{1}{3}$ by $\frac{2}{5} = \frac{1}{3} \times \frac{2}{5} = \frac{1 \times 2}{3 \times 5} = \frac{2}{15}$
- b. $\frac{5}{6}$ by $\frac{7}{10} = \frac{5}{6} \times \frac{7}{10} = \frac{\cancel{5} \times 7}{6 \times \cancel{10}} = \frac{1 \times 7}{6 \times 2} = \frac{7}{12}$
- c. $\frac{3}{11}$ by $\frac{22}{27} = \frac{3}{11} \times \frac{22}{27} = \frac{\cancel{3} \times \cancel{22}^2}{\cancel{11} \times \cancel{27}_9} = \frac{1 \times 2}{1 \times 9} = \frac{2}{9}$
- d. $\frac{16}{75}$ by $\frac{15}{24} = \frac{16}{75} \times \frac{15}{24} = \frac{\cancel{16} \times \cancel{15}^1}{\cancel{75}_5 \times \cancel{24}_3} = \frac{2 \times 1}{5 \times 3} = \frac{2}{15}$
2. a. $5\frac{1}{5}$ by $7 = \frac{26}{5} \times 7 = \frac{26 \times 7}{5} = \frac{182}{5} = 36\frac{2}{5}$
- b. $3\frac{3}{4}$ by $12 = \frac{15}{4} \times 12 = \frac{15 \times \cancel{12}^3}{\cancel{4}_1} = 15 \times 3 = 45$

$$c. 3\frac{5}{6} \text{ by } 15 = \frac{23}{6} \times 15 = \frac{23 \times \cancel{15}^5}{\cancel{6}_2} = \frac{23 \times 5}{2} = \frac{115}{2} = 57\frac{1}{2}$$

$$d. 6\frac{3}{8} \text{ by } 12 = \frac{51}{8} \times 12 = \frac{51 \times \cancel{12}^3}{\cancel{8}_2} = \frac{153}{2} = 76\frac{1}{2}$$

$$3. a. \frac{7}{22} \times \frac{11}{14} = \frac{\cancel{7}^1 \times \cancel{11}^1}{2 \times \cancel{22}^2 \times \cancel{14}_2} = \frac{1 \times 1}{2 \times 2} = \frac{1}{4}$$

$$b. \frac{5}{16} \times \frac{1}{15} = \frac{\cancel{5}^1 \times 1}{16 \times \cancel{15}_3} = \frac{1 \times 1}{16 \times 3} = \frac{1}{48}$$

$$c. \frac{3}{11} \times \frac{5}{6} = \frac{\cancel{3}^1 \times 5}{11 \times \cancel{6}_2} = \frac{1 \times 5}{11 \times 2} = \frac{5}{22}$$

$$d. \frac{2}{5} \times \frac{15}{16} = \frac{\cancel{2}^1 \times \cancel{15}^3}{\cancel{5}_1 \times \cancel{16}_8} = \frac{1 \times 3}{1 \times 8} = \frac{3}{8}$$

$$4. a. \frac{4}{11} \times \frac{22}{5} = \frac{4 \times \cancel{22}^2}{\cancel{11}^1 \times 5} = \frac{4 \times 2}{1 \times 5} = \frac{8}{5} = 1\frac{3}{5}$$

$$b. \frac{6}{7} \times \frac{21}{18} = \frac{\cancel{6}^1 \times \cancel{21}^3}{\cancel{7}^1 \times \cancel{18}_3} = \frac{1 \times 1}{1 \times 1} = 1$$

$$c. \frac{10}{11} \times \frac{22}{25} = \frac{\cancel{10}^2 \times \cancel{22}^2}{\cancel{11}^1 \times \cancel{25}_5} = \frac{2 \times 2}{1 \times 5} = \frac{4}{5}$$

$$d. \frac{15}{8} \times \frac{4}{5} = \frac{\cancel{15}^3 \times \cancel{4}^1}{\cancel{2}^2 \times \cancel{5}_1} = \frac{3 \times 1}{2 \times 1} = \frac{3}{2} = 1\frac{1}{2}$$

$$5. a. \frac{14}{15} \times 6\frac{3}{7} = \frac{14}{15} \times \frac{45}{7} = \frac{\cancel{14}^2 \times \cancel{45}^3}{\cancel{15}^3 \times \cancel{7}_1} = \frac{2 \times 3}{1 \times 1} = 6$$

$$b. 2\frac{2}{3} \times \frac{3}{5} = \frac{8}{3} \times \frac{3}{5} = \frac{\cancel{8}^1 \times \cancel{3}^1}{1 \times 5} = \frac{8 \times 1}{1 \times 5} = \frac{8}{5} = 1\frac{3}{5}$$

$$c. \frac{5}{6} \times 3\frac{1}{10} = \frac{5}{6} \times \frac{31}{10} = \frac{\cancel{5}^1 \times 31}{\cancel{6}_2 \times \cancel{10}_2} = \frac{1 \times 31}{6 \times 2} = \frac{31}{12} = 2\frac{7}{12}$$

$$d. 3\frac{4}{27} \times \frac{18}{25} = \frac{85}{27} \times \frac{18}{25} = \frac{\cancel{85}^5 \times \cancel{18}^2}{\cancel{27}^3 \times \cancel{25}_5} = \frac{17 \times 2}{3 \times 5} = \frac{34}{15} = 2\frac{4}{15}$$

EXERCISE 8 C

$$1. a. \frac{1}{4} \text{ of } 28 = \frac{1}{4} \times 28 = \frac{1 \times \cancel{28}^7}{\cancel{4}_1} = 7$$

$$b. \frac{2}{7} \text{ of } 56 = \frac{2}{7} \times 56 = \frac{2 \times \cancel{56}^8}{\cancel{7}_1} = 2 \times 8 = 16$$

$$c. \frac{3}{5} \text{ of } 50 = \frac{3}{5} \times 50 = \frac{3 \times \cancel{50}^{10}}{\cancel{5}_1} = 3 \times 10 = 30$$

$$d. \frac{3}{8} \text{ of } 200 = \frac{3}{8} \times 200 = \frac{3 \times \cancel{200}^{25}}{\cancel{8}_1} = 3 \times 25 = 75$$

$$2. a. \frac{3}{5} \text{ of } \frac{15}{39} = \frac{3}{5} \times \frac{15}{39} = \frac{3 \times \cancel{15}^3}{\cancel{5}^1 \times \cancel{39}_{13}} = \frac{3 \times 1}{1 \times 13} = \frac{3}{13}$$

$$b. \frac{1}{2} \text{ of } \frac{3}{8} = \frac{1}{2} \times \frac{3}{8} = \frac{1 \times 3}{2 \times 8} = \frac{3}{16}$$

$$c. 2\frac{3}{10} \text{ of } 40 = \frac{23}{10} \times 40 = \frac{23 \times 40}{10} = 23 \times 4 = 92$$

$$d. \frac{3}{4} \text{ of } 3\frac{2}{3} = \frac{3}{4} \times \frac{11}{3} = \frac{3 \times 11}{4 \times 3} = \frac{11}{4} = 2\frac{3}{4}$$

3. a. $\therefore 1 \text{ rupee} = 100 \text{ paise}$

$$\therefore \frac{1}{5} \text{ of } 100 \text{ paise} = \frac{1}{5} \times 100 = \frac{1 \times 100}{5} = 20 \text{ paise}$$

$$b. \frac{2}{7} \text{ of } ₹ 25 = ₹ \frac{2}{7} \times 25 = ₹ \frac{2 \times 25}{7} = ₹ \frac{50}{7} = ₹ 7\frac{1}{7}$$

c. $\therefore 1 \text{ rupee} = 100 \text{ paise}$

$$\therefore \frac{3}{4} \text{ of } 100 \text{ paise} = \frac{3}{4} \times 100 = \frac{3 \times 100}{4} = 3 \times 25 = 75 \text{ paise}$$

$$d. \frac{7}{15} \text{ of } ₹ 75 = ₹ \frac{7}{15} \times 75 = ₹ \frac{7 \times 75}{15} = ₹ 7 \times 5 = ₹ 35$$

4. a. $\therefore 1 \text{ kg} = 1000 \text{ g}$

$$\therefore \frac{3}{4} \text{ of } 1000 \text{ g} = \frac{3}{4} \times 1000 = \frac{3 \times 1000}{4} = 3 \times 250 = 750 \text{ g}$$

$$b. \frac{5}{8} \text{ of } 40 \text{ kg} = \frac{5}{8} \times 40 \text{ kg} = \frac{5 \times 40}{8} = 5 \times 5 = 25 \text{ kg}$$

$$c. \frac{8}{13} \text{ of } 52 \text{ kg} = \frac{8}{13} \times 52 \text{ kg} = \frac{8 \times 52}{13} = 8 \times 4 = 32 \text{ kg}$$

5. a. $\therefore 1 \text{ km} = 1000 \text{ m}$

$$\therefore \frac{9}{10} \text{ of } 1000 \text{ m} = \frac{9}{10} \times 1000 \text{ m} = \frac{9 \times 1000}{10} = 9 \times 100 = 900 \text{ m}$$

b. $\therefore 1 \text{ m} = 100 \text{ cm}$

$$\therefore \frac{3}{4} \text{ of } 100 \text{ cm} = \frac{3}{4} \times 100 \text{ cm} = \frac{3 \times 100}{4} = 3 \times 25 = 75 \text{ cm}$$

$$c. \frac{3}{14} \text{ of } 70 \text{ km} = \frac{3}{14} \times 70 \text{ km} = \frac{3 \times 70}{14} = 3 \times 5 = 15 \text{ km}$$

6. a. $\therefore 1 \text{ l} = 1000 \text{ ml}$

$$\therefore \frac{11}{25} \text{ of } 1000 \text{ ml} = \frac{11}{25} \times 1000 \text{ ml} = \frac{11 \times 1000}{25} = 11 \times 40 = 440 \text{ ml}$$

$$b. \frac{3}{10} \text{ of } 40 \text{ l} = \frac{3}{10} \times 40 \text{ l} = \frac{3 \times 40}{10} = 3 \times 4 = 12 \text{ l}$$

c. $\therefore 1 \text{ l} = 1000 \text{ ml}$

$$\therefore \frac{1}{100} \text{ of } 1000 \text{ ml} = \frac{1}{100} \times 1000 \text{ ml} = \frac{1 \times 1000}{100} = 10 \text{ ml}$$

EXERCISE 8 D

1. a. The reciprocal of $\frac{2}{7}$ is $\frac{7}{2}$.
b. The reciprocal of $\frac{4}{5}$ is $\frac{5}{4}$.
c. The reciprocal of $\frac{8}{9}$ is $\frac{9}{8}$.
d. The reciprocal of $\frac{15}{7}$ is $\frac{7}{15}$.
e. The reciprocal of $\frac{1}{6}$ is 6.
f. The reciprocal of $\frac{1}{20}$ is 20.
2. a. $3\frac{1}{3} = \frac{10}{3}$, \therefore The required reciprocal is $\frac{3}{10}$.
b. $4\frac{1}{4} = \frac{17}{4}$, \therefore The required reciprocal is $\frac{4}{17}$.
c. $5\frac{3}{5} = \frac{28}{5}$, \therefore The required reciprocal is $\frac{5}{28}$.
d. The reciprocal of 8 is $\frac{1}{8}$.
e. The reciprocal of 3 is $\frac{1}{3}$.
f. The reciprocal of 2 is $\frac{1}{2}$.
3. a. $\frac{2}{11} \times \frac{11}{2} = \frac{\cancel{2} \times \cancel{11}}{\cancel{11} \times \cancel{2}} = 1$
b. $\frac{7}{15} \times 2\frac{1}{7} = \frac{7}{15} \times \frac{15}{7} = \frac{\cancel{7} \times \cancel{15}}{\cancel{15} \times \cancel{7}} = 1$
c. $\frac{4}{17} \times$ the reciprocal of $\frac{4}{17} = 1$
d. $4\frac{1}{5} = \frac{21}{5}$, \therefore The reciprocal of $\frac{21}{5} \times \frac{21}{5} = 1$
 $\therefore \frac{4}{17} \times \boxed{\frac{17}{4}} = 1$
 $\therefore \boxed{\frac{5}{21}} \times \frac{21}{5} = 1$
4. a. $\frac{1}{3}$ by 3 = $\frac{1}{3} \div 3$
The reciprocal of 3 is $\frac{1}{3}$
 $\therefore \frac{1}{3} \div 3 = \frac{1}{3} \times \frac{1}{3} = \frac{1 \times 1}{3 \times 3} = \frac{1}{9}$
b. $\frac{2}{7}$ by 3 = $\frac{2}{7} \div 3$
The reciprocal of 3 is $\frac{1}{3}$
 $\therefore \frac{2}{7} \div 3 = \frac{2}{7} \times \frac{1}{3} = \frac{2 \times 1}{7 \times 3} = \frac{2}{21}$
c. $\frac{9}{16}$ by 5 = $\frac{9}{16} \div 5$
The reciprocal of 5 is $\frac{1}{5}$
 $\therefore \frac{9}{16} \div 5 = \frac{9}{16} \times \frac{1}{5} = \frac{9 \times 1}{16 \times 5} = \frac{9}{80}$
5. a. 9 by $\frac{6}{17} = 9 \div \frac{6}{17}$
The reciprocal of $\frac{6}{17}$ is $\frac{17}{6}$
 $\therefore 9 \div \frac{6}{17} = 9 \times \frac{17}{6} = \frac{3\cancel{9} \times 17}{2\cancel{6}} = \frac{51}{2} = 25\frac{1}{2}$
b. 15 by $\frac{5}{12} = 15 \div \frac{5}{12}$
The reciprocal of $\frac{5}{12}$ is $\frac{12}{5}$
 $\therefore 15 \div \frac{5}{12} = 15 \times \frac{12}{5} = \frac{3\cancel{15} \times 12}{1\cancel{5}} = 36$
c. 3 by $\frac{9}{10} = 3 \div \frac{9}{10}$
The reciprocal of $\frac{9}{10}$ is $\frac{10}{9}$
 $\therefore 3 \div \frac{9}{10} = 3 \times \frac{10}{9} = \frac{1\cancel{3} \times 10}{3\cancel{9}} = \frac{10}{3} = 3\frac{1}{3}$

6. a. $5\frac{2}{5}$ by $18 = \frac{27}{5} \div 18$

The reciprocal of 18 is $\frac{1}{18}$

$$\begin{aligned} \therefore \frac{27}{5} \div 18 &= \frac{27}{5} \times \frac{1}{18} \\ &= \frac{3\cancel{27} \times 1}{5 \times \cancel{18}_2} = \frac{3}{10} \end{aligned}$$

b. 7 by $4\frac{3}{8} = 7 \div \frac{35}{8}$

The reciprocal of $\frac{35}{8}$ is $\frac{8}{35}$

$$\begin{aligned} \therefore 7 \div \frac{35}{8} &= 7 \times \frac{8}{35} = \frac{1\cancel{7} \times 8}{\cancel{35}_5} \\ &= \frac{8}{5} = 1\frac{3}{5} \end{aligned}$$

c. $7\frac{1}{3}$ by $11 = \frac{22}{3} \div 11$

The reciprocal of 11 is $\frac{1}{11}$

$$\begin{aligned} \therefore \frac{22}{3} \div 11 &= \frac{22}{3} \times \frac{1}{11} \\ &= \frac{2\cancel{22} \times 1}{3 \times \cancel{11}_1} = \frac{2}{3} \end{aligned}$$

7. a. $\frac{3}{7} \div 21$

The reciprocal of 21 is $\frac{1}{21}$

$$\begin{aligned} \therefore \frac{3}{7} \div 21 &= \frac{3}{7} \times \frac{1}{21} \\ &= \frac{1\cancel{3} \times 1}{7 \times \cancel{21}_7} = \frac{1}{49} \end{aligned}$$

7. b. $14 \div \frac{2}{7}$

The reciprocal of $\frac{2}{7}$ is $\frac{7}{2}$

$$\begin{aligned} \therefore 14 \div \frac{2}{7} &= 14 \times \frac{7}{2} \\ &= \frac{7\cancel{14} \times 7}{\cancel{2}_1} = 49 \end{aligned}$$

7. c. $5 \div 3\frac{1}{3} = 5 \div \frac{10}{3}$

The reciprocal of $\frac{10}{3}$ is $\frac{3}{10}$

$$\begin{aligned} \therefore 5 \div \frac{10}{3} &= 5 \times \frac{3}{10} \\ &= \frac{1\cancel{5} \times 3}{\cancel{10}_2} = \frac{3}{2} = 1\frac{1}{2} \end{aligned}$$

8. a. $5\frac{5}{12} \div \frac{5}{16} = \frac{65}{12} \div \frac{5}{16}$

The reciprocal of $\frac{5}{16}$ is $\frac{16}{5}$

$$\begin{aligned} \therefore \frac{65}{12} \div \frac{5}{16} &= \frac{65}{12} \times \frac{16}{5} = \frac{13\cancel{65} \times \cancel{16}^4}{3\cancel{12} \times \cancel{5}_1} \\ &= \frac{52}{3} = 17\frac{1}{3} \end{aligned}$$

8. b. $10\frac{3}{8} \div \frac{5}{36} = \frac{83}{8} \div \frac{5}{36}$

The reciprocal of $\frac{5}{36}$ is $\frac{36}{5}$

$$\begin{aligned} \therefore \frac{83}{8} \div \frac{5}{36} &= \frac{83}{8} \times \frac{36}{5} = \frac{83 \times \cancel{36}^9}{2\cancel{8} \times 5} \\ &= \frac{747}{10} = 74\frac{7}{10} \end{aligned}$$

8. c. $2\frac{2}{5} \div \frac{8}{5} = \frac{12}{5} \div \frac{8}{5}$

The reciprocal of $\frac{8}{5}$ is $\frac{5}{8}$

$$\therefore \frac{12}{5} \div \frac{8}{5} = \frac{12}{5} \times \frac{5}{8} = \frac{3\cancel{12} \times \cancel{5}}{\cancel{5} \times \cancel{8}_2} = \frac{3}{2} = 1\frac{1}{2}$$

EXERCISE 8 E

1. Total marbles = 45

Black marbles = $\frac{2}{5}$ of 45 = $\frac{2}{5} \times 45 = \frac{2 \times \cancel{45}^9}{\cancel{5}_1} = 18$

Green marbles = $\frac{1}{9}$ of 45 = $\frac{1}{9} \times 45 = \frac{1 \times \cancel{45}^5}{\cancel{9}_1} = 5$

White marbles = $45 - (18 + 5) = 45 - 23 = 22$

So, Manu has 22 white marbles.

2. Meera purchased sugar = $1\frac{1}{2}$ kg = $\frac{3}{2}$ kg

She used sugar = $\frac{1}{4}$ of $\frac{3}{2}$ = $\frac{1}{4} \times \frac{3}{2}$ = $\frac{1 \times 3}{4 \times 2}$ = $\frac{3}{8}$ kg.

Left sugar = $\frac{3}{2} - \frac{3}{8}$ = $\frac{4 \times 3 - 1 \times 3}{8}$ = $\frac{12 - 3}{8}$ = $\frac{9}{8}$ = $1\frac{1}{8}$ kg.

So, $1\frac{1}{8}$ kg sugar is left.

3. Total number of students = 50

Number of girls = $\frac{1}{5}$ of 50 = $\frac{1}{5} \times 50$ = $\frac{1 \times 50}{\cancel{5}_1}$ = 10

So, girls students are 10.

4. Total pages = 250

Read pages = $\frac{1}{5}$ of 250 = $\frac{1}{5} \times 250$ = $\frac{1 \times 250}{\cancel{5}_1}$ = 50

Left pages = 250 - 50 = 200

So, read pages are 50 and left pages are 200

5. Asha bought sweets = $\frac{5}{8}$ of 1 kg = $\frac{5}{8} \times 1000$ g = $\frac{5 \times 1000}{\cancel{8}_1}^{125}$ = 5×125 = 625 g.

She ate sweets = $\frac{1}{5}$ of 625 kg = $\frac{1}{5} \times 625$ g = $\frac{1 \times 625}{\cancel{5}_1}^{125}$ = 125

So, Asha eat 125 g of sweets.

6. Sagar earns in a month = ₹ 10,000

He spends on house rent = $\frac{1}{5}$ of ₹ 10,000 = $\frac{1}{5} \times ₹ 10,000$ = $\frac{1 \times 10000}{\cancel{5}_1}^{2000}$ = ₹ 2000

He spends for personal expenses = $\frac{1}{2}$ of ₹ 10,000 = $\frac{1}{2} \times ₹ 10,000$ = $\frac{1 \times 10000}{\cancel{2}_1}^{5000}$
= ₹ 5000

So, Sagar spends ₹ 2000 on house rent and ₹ 5000 for his personal expenses.

7. Perimeter of field = $2\frac{1}{3}$ km = $\frac{7}{3}$ km

Raman takes rounds = 3

∴ Total distance did he run = $\frac{7}{3} \times 3$ = $\frac{7 \times \cancel{3}^1}{\cancel{3}_1}$ = 7 km

So, Raman runs 7 km.

8. Total received bags = 112

Vegetables bags = $\frac{1}{2}$ of 112 = $\frac{1}{2} \times 112$ = $\frac{1 \times 112}{\cancel{2}_1}^{56}$ = 56 bags

∴ Number of potatoes bags = $\frac{1}{7}$ of 56 = $\frac{1}{7} \times 56$ = $\frac{1 \times 56}{\cancel{7}_1}^8$ = 8 bags

So, 8 bags of potato did the store received on that day.

EXERCISE 9

1. a. In 20.8, the integral part is 20 and the decimal part is .8.
 b. In 3.79, the integral part is 3 and the decimal part is .79.
 c. In 60.056, the integral part is 60 and the decimal part is .056.
 d. In 286.7846, the integral part is 286 and the decimal part is .7846.
 e. In 2060.23836, the integral part is 2060 and the decimal part is .23836.

2. a. 0.43

The number of digits in the decimal part = 2

∴ the denominator = 100

$$\text{The fraction} = \frac{43}{100}$$

- b. 0.567

The number of digits in the decimal part = 3

∴ the denominator = 1000

$$\text{The fraction} = \frac{567}{1000}$$

- c. 0.081

The number of digits in the decimal part = 3

∴ the denominator = 1000

$$\text{The fraction} = \frac{81}{1000}$$

- d. 0.6052

The number of digits in the decimal part = 4

∴ the denominator = 10000

$$\text{The fraction} = \frac{6052}{10000}$$

3. a. $\frac{37}{10} = 3.7$ b. $\frac{67}{10} = 6.7$ c. $\frac{82}{100} = 0.82$ d. $60\frac{33}{1000} = \frac{60033}{1000} = 60.033$

4. a. 3, 8, 9 b. 4, 9, 0, 7, 6
 c. tens, ones, tenths, hundredths, thousandths

5. a. 48.37 b. 7.603 c. 784.003

6. a. 2.47 b. 45.38 c. 69.003 d. 7.025

7. a. $7.3 = 7 + \frac{3}{10}$ b. $4.26 = 4 + \frac{2}{10} + \frac{6}{100}$

- c. $12.03 = 10 + 2 + \frac{0}{10} + \frac{3}{100}$ d. $43.231 = 40 + 3 + \frac{2}{10} + \frac{3}{100} + \frac{1}{1000}$

- e. $670.2053 = 600 + 70 + 0 + \frac{2}{10} + \frac{0}{100} + \frac{5}{1000} + \frac{3}{10000}$

8. a. $0.35 = .35$ b. $4.85 > 4.58$ c. $67.3 > 60.73$ d. $9.4 = 9.400$

9. a. 6.9, 6.09, 6.92, 9.092, 6.902

Equivalent decimal numbers : 6.900, 6.090, 6.920, 6.092, 6.902

In ascending order : 6.090, 6.092, 6.900, 6.902, 6.920

or 6.09, 6.092, 6.9, 6.902, 6.92

- b. 32.3, 30.32, 323.02, 30.2030, 30.302

Equivalent decimal numbers : 32.3000, 30.3200, 323.0200, 30.2030, 30.3020

In ascending order : 30.2030, 30.3020, 30.3200, 32.3000, 323.0200

or 30.2030, 30.302, 30.32, 32.3, 323.02

10. a. 0.080, 0.0086, 0.78, 0.0788

Equivalent decimal numbers : 0.0800, 0.0086, 0.7800, 0.0788

In descending order : 0.7800, 0.0800, 0.0788, 0.0086

or 0.78, 0.080, 0.0788, 0.0086

- b. 25.446, 0.2546, 254.46, 2.5446, 254.6

Equivalent decimal numbers : 25.4460, 0.2546, 254.4600, 2.5446, 254.6000

In descending order : 254.6000, 254.4600, 25.4460, 2.5446, 0.2546

or 254.6, 254.46, 25.446, 2.5446, 0.2546

Chapter 10 Operations with Decimals

EXERCISE 10 A

1. a.
$$\begin{array}{r} 0.480 \\ + 3.579 \\ \hline 4.059 \end{array}$$
 b.
$$\begin{array}{r} 6.253 \\ + 0.780 \\ \hline 7.033 \end{array}$$
 c.
$$\begin{array}{r} 86.835 \\ + 48.167 \\ \hline 135.002 \end{array}$$
 d.
$$\begin{array}{r} 354.794 \\ + 632.256 \\ \hline 987.050 \end{array}$$

2. a.
$$\begin{array}{r} 15.952 \\ + 23.865 \\ + 9.250 \\ + 38.107 \\ \hline 87.174 \end{array}$$
 b.
$$\begin{array}{r} 2.0045 \\ + 1.1027 \\ + 0.9600 \\ + 4.3040 \\ \hline 8.3712 \end{array}$$
 c.
$$\begin{array}{r} 911.250 \\ + 458.386 \\ + 76.430 \\ + 225.021 \\ \hline 1668.087 \end{array}$$
 d.
$$\begin{array}{r} 63.195 \\ + 52.481 \\ + 75.624 \\ + 490.521 \\ \hline 681.821 \end{array}$$

3. a.
$$\begin{array}{r} 262.060 \\ + 75.800 \\ + 0.595 \\ \hline 338.455 \end{array}$$
 b.
$$\begin{array}{r} 11.700 \\ + 4.470 \\ + 0.857 \\ + 30.140 \\ \hline 47.167 \end{array}$$
 4. a.
$$\begin{array}{r} ₹ 66.00 \\ + ₹ 7.30 \\ + ₹ 6.70 \\ \hline ₹ 80.00 \end{array}$$
 b.
$$\begin{array}{r} ₹ 346.15 \\ + ₹ 660.75 \\ + ₹ 50.80 \\ + ₹ 0.45 \\ \hline ₹ 1058.15 \end{array}$$

5. a.
$$\begin{array}{r} 540.500 \\ - 369.421 \\ \hline 171.079 \end{array}$$
 b.
$$\begin{array}{r} 0.389 \\ - 0.297 \\ \hline 0.092 \end{array}$$
 c.
$$\begin{array}{r} 43.802 \\ - 24.657 \\ \hline 19.145 \end{array}$$
 d.
$$\begin{array}{r} 763.200 \\ - 549.543 \\ \hline 213.657 \end{array}$$

6. a.
$$\begin{array}{r} 16.250 \\ - 9.756 \\ \hline 6.494 \end{array}$$
 b.
$$\begin{array}{r} 400.125 \\ - 368.550 \\ \hline 31.575 \end{array}$$
 c.
$$\begin{array}{r} 3.50 \\ - 2.84 \\ \hline 0.66 \end{array}$$

7. a.
$$\begin{array}{r} ₹ 100.00 \\ - ₹ 65.25 \\ \hline ₹ 34.75 \end{array}$$

b.
$$\begin{array}{r} ₹ 154.62 \\ - ₹ 78.00 \\ \hline ₹ 76.62 \end{array}$$

c.
$$\begin{array}{r} ₹ 940.25 \\ - ₹ 75.50 \\ \hline ₹ 864.75 \end{array}$$

EXERCISE 10 B

1. a. 0.3×7

$$\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$$

Product = 2.1

b. 3.6×12

$$\begin{array}{r} 36 \\ \times 12 \\ \hline 72 \\ 36 \\ \hline 432 \end{array}$$

Product = 43.2

c. 5.27×3

$$\begin{array}{r} 527 \\ \times 3 \\ \hline 1581 \end{array}$$

Product = 15.81

d. 6.63×14

$$\begin{array}{r} 663 \\ \times 14 \\ \hline 2652 \\ 663 \\ \hline 9282 \end{array}$$

Product = 92.82

e. 1.324×25

$$\begin{array}{r} 1324 \\ \times 25 \\ \hline 6620 \\ 2648 \\ \hline 33100 \end{array}$$

Product = 33.100 = 33.1

2. a. 0.5×5

$$\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$$

Product = 2.5

b. 1.4×8

$$\begin{array}{r} 14 \\ \times 8 \\ \hline 112 \end{array}$$

Product = 11.2

c. 0.7×6

$$\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$$

Product = 4.2

d. 3.4×13

$$\begin{array}{r} 3.4 \\ \times 13 \\ \hline 102 \\ 34 \\ \hline 442 \end{array}$$

Product = 44.2

3. a. 0.75×12

$$\begin{array}{r} 75 \\ \times 12 \\ \hline 150 \\ 75 \\ \hline 900 \end{array}$$

Product = 9.00 = 9

b. 2.43×11

$$\begin{array}{r} 243 \\ \times 11 \\ \hline 243 \\ 243 \\ \hline 2673 \end{array}$$

Product = 26.73

c. 21.36×15

$$\begin{array}{r} 2136 \\ \times 15 \\ \hline 10680 \\ 2136 \\ \hline 32040 \end{array}$$

Product = 320.40 = 320.4

d. 5.128×16

$$\begin{array}{r} 5128 \\ \times 16 \\ \hline 30768 \\ 5128 \\ \hline 82048 \end{array}$$

Product = 82.048

4. a. 2.4×23

$$\begin{array}{r} 24 \\ \times 23 \\ \hline 72 \\ 48 \\ \hline 552 \end{array}$$

Product = 55.2

b. 0.25×35

$$\begin{array}{r} 25 \\ \times 35 \\ \hline 125 \\ 75 \\ \hline 875 \end{array}$$

Product = 8.75

c. 3.63×37

$$\begin{array}{r} 363 \\ \times 37 \\ \hline 2541 \\ 1089 \\ \hline 13431 \end{array}$$

Product = 134.31

d. 4.131×45

$$\begin{array}{r} 4131 \\ \times 45 \\ \hline 20655 \\ 16524 \\ \hline 185895 \end{array}$$

Product = 185.895

5. a. 1.234×128

$$\begin{array}{r} 1234 \\ \times 128 \\ \hline 9872 \\ 2468 \\ 1234 \\ \hline 157952 \end{array}$$

Product = 157.952

b. 0.74×450

$$\begin{array}{r} 74 \\ \times 450 \\ \hline 00 \\ 370 \\ 296 \\ \hline 33300 \end{array}$$

Product = 333.00 = 333

c. 2.147×123

$$\begin{array}{r} 2147 \\ \times 123 \\ \hline 6441 \\ 4294 \\ 2147 \\ \hline 264081 \end{array}$$

Product = 264.081

d. 4.324×205

$$\begin{array}{r} 4324 \\ \times 205 \\ \hline 21620 \\ 0000 \\ 8648 \\ \hline 886420 \end{array}$$

Product = 886.420 = 886.42

6. a. $6.23 \times 10 = 62.3$ b. $0.356 \times 10 = 3.56$ c. $23.7 \times 10 = 237$
 d. $0.825 \times 100 = 82.5$ e. $245.3 \times 100 = 24530$ f. $3676.41 \times 100 = 367641$
 g. $3.676 \times 1000 = 3676$ h. $0.38 \times 1000 = 380$ i. $2.4695 \times 1000 = 2469.5$

7. a. $4.15 \times 40 = 41.5 \times 4$ b. $0.55 \times 60 = 5.5 \times 6$ c. $1.58 \times 70 = 15.8 \times 7$ d. $0.143 \times 500 = 14.3 \times 5$

$$\begin{array}{r} 415 \\ \times 4 \\ \hline 1660 \end{array}$$

Product = 166.0
= 166

$$\begin{array}{r} 55 \\ \times 6 \\ \hline 330 \end{array}$$

Product = 33.0
= 33

$$\begin{array}{r} 158 \\ \times 7 \\ \hline 1106 \end{array}$$

Product = 110.6

$$\begin{array}{r} 143 \\ \times 5 \\ \hline 715 \end{array}$$

Product = 71.5

EXERCISE 10 C

1. a. 0.4×1.3 b. 2.7×1.2 c. 3.05×7.2 d. 2.72×0.25 e. 3.643×0.07

$$\begin{array}{r} 13 \\ \times 4 \\ \hline 52 \end{array}$$

Product = 0.52

$$\begin{array}{r} 27 \\ \times 12 \\ \hline 54 \\ 27 \\ \hline 324 \end{array}$$

Product = 3.24

$$\begin{array}{r} 305 \\ \times 72 \\ \hline 610 \\ 2135 \\ \hline 21960 \end{array}$$

Product = 21.960
= 21.96

$$\begin{array}{r} 272 \\ \times 25 \\ \hline 1360 \\ 544 \\ \hline 6800 \end{array}$$

Product = 0.6800
= 0.68

$$\begin{array}{r} 3643 \\ \times 7 \\ \hline 25501 \end{array}$$

Product = 0.25501

2. a. 0.5×0.4 b. 2.3×0.5 c. 3.8×1.4 d. 12.5×0.8

$$\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array}$$

Product = 0.20
= 0.2

$$\begin{array}{r} 23 \\ \times 5 \\ \hline 115 \end{array}$$

Product = 1.15

$$\begin{array}{r} 38 \\ \times 14 \\ \hline 152 \\ 38 \\ \hline 532 \end{array}$$

Product = 5.32

$$\begin{array}{r} 125 \\ \times 8 \\ \hline 1000 \end{array}$$

Product = 10.00
= 10

3. a. 0.6×2.14 b. 2.58×0.3 c. 2.63×0.73 d. 0.54×3.23

$$\begin{array}{r} 214 \\ \times 6 \\ \hline 1284 \end{array}$$

Product = 1.284

$$\begin{array}{r} 258 \\ \times 3 \\ \hline 774 \end{array}$$

Product = 0.774

$$\begin{array}{r} 263 \\ \times 73 \\ \hline 789 \\ 1841 \\ \hline 19199 \end{array}$$

Product = 1.9199

$$\begin{array}{r} 323 \\ \times 54 \\ \hline 1292 \\ 1615 \\ \hline 17442 \end{array}$$

Product = 1.7442

4. a. 0.543×2.34 b. 3.67×1.047 c. 4.052×0.006 d. 0.2341×2.56

$$\begin{array}{r} 543 \\ \times 234 \\ \hline 2172 \\ 1629 \\ 1086 \\ \hline 127062 \end{array}$$

Product = 1.27062

$$\begin{array}{r} 1047 \\ \times 367 \\ \hline 7329 \\ 6282 \\ 3141 \\ \hline 384249 \end{array}$$

Product = 3.84249

$$\begin{array}{r} 4052 \\ \times 6 \\ \hline 24312 \end{array}$$

Product = 0.024312

$$\begin{array}{r} 2341 \\ \times 256 \\ \hline 14046 \\ 11705 \\ 4682 \\ \hline 599296 \end{array}$$

Product = 0.599296

5. a. 3.5 b. 1.7 c. 0.24 d. 0.47 e. 1 f. 5.7
 g. 1 h. 0 i. 0 j. 1.4 k. 12

6. a. $0.3 \times 0.3 \times 0.3$

3	9
× 3	× 3
9	27

Product = 0.027

b. $1.2 \times 2.1 \times 30 = 1.2 \times 21 \times 3$

21	63
× 3	× 12
63	126
	63
	756

Product = 75.6

c. $0.4 \times 1.6 \times 15$

16	64
× 4	× 15
64	320
	64
	960

Product = 9.60 = 9.6

7. a. $1.35 \times 0.73 \times 2.8$

135	9855
× 73	× 28
405	78840
945	19710
9855	275940

Product = 2.75940 = 2.7594

b. $0.2 \times 1.22 \times 0.222$

122	244
× 2	× 222
244	488
	488
	488
	54168

Product = 0.054168

c. $0.8 \times 2.5 \times 3.6$

$3.6 \times 200 = 360 \times 2$

25	360
× 8	× 2
200	720

Product = 7.20 = 7.2

8. a. 2.3×1.7

23
× 17
161
23
391

Product = 3.91

8. b. 3.3×4.3

33
× 43
99
132
1419

Product = 14.19

8. c. 3.62×0.3

362
× 3
1086

Product = 1.086

9. a. 0.87×0.04

87
× 4
348

Product = 0.0348

9. b. 3.42×0.06

342
× 6
2052

Product = 9.765

9. c. 0.234×1.24

234
× 124
936
468
234
29016

Product = 0.29016

10. a. 5.032×2.011

5032
× 2011
5032
5032
000
10064
10119352

Product = 10.119352

10. b. $0.2 \times 2.2 \times 2.02$

22	202
× 2	× 44
44	808
	808
	8888

Product = 0.8888

10. c. $0.07 \times 0.006 \times 0.15$

7	42
× 6	× 15
42	210
	42
	630

Product = 0.0000630 = 0.000063

EXERCISE 10 D

1. a.
$$\begin{array}{r} 6.3 \\ 6 \overline{)37.8} \\ \underline{-36} \\ 18 \\ \underline{-18} \\ 0 \end{array}$$

b.
$$\begin{array}{r} 5.41 \\ 13 \overline{)70.33} \\ \underline{-65} \\ 53 \\ \underline{-52} \\ 13 \\ \underline{-13} \\ 0 \end{array}$$

c.
$$\begin{array}{r} 5.093 \\ 14 \overline{)71.302} \\ \underline{-70} \\ 130 \\ \underline{-126} \\ 42 \\ \underline{-42} \\ 0 \end{array}$$

d.
$$\begin{array}{r} 2.34 \\ 8 \overline{)18.72} \\ \underline{-16} \\ 27 \\ \underline{-24} \\ 32 \\ \underline{-32} \\ 0 \end{array}$$

2. a.
$$\begin{array}{r} 3.2 \\ 4 \overline{)12.8} \\ \underline{-12} \\ 08 \\ \underline{-8} \\ 0 \end{array}$$

Q=3.2

b.
$$\begin{array}{r} 3.1 \\ 7 \overline{)21.7} \\ \underline{-21} \\ 07 \\ \underline{-7} \\ 0 \end{array}$$

Q=3.1

c.
$$\begin{array}{r} 3.4 \\ 9 \overline{)30.6} \\ \underline{-27} \\ 36 \\ \underline{-36} \\ 0 \end{array}$$

Q=3.4

d.
$$\begin{array}{r} 5.2 \\ 6 \overline{)31.2} \\ \underline{-30} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

Q=5.2

3. a.
$$\begin{array}{r} 0.4 \\ 7 \overline{)2.8} \\ \underline{-2.8} \\ 0 \end{array}$$

Q=0.4

b.
$$\begin{array}{r} 0.8 \\ 6 \overline{)4.8} \\ \underline{-4.8} \\ 0 \end{array}$$

Q=0.8

c.
$$\begin{array}{r} 0.05 \\ 9 \overline{)0.45} \\ \underline{-45} \\ 0 \end{array}$$

Q=0.05

d.
$$\begin{array}{r} 0.42 \\ 7 \overline{)2.94} \\ \underline{-28} \\ 14 \\ \underline{-14} \\ 0 \end{array}$$

Q=0.42

4. a.
$$\begin{array}{r} 6.05 \\ 13 \overline{)78.65} \\ \underline{-78} \\ 065 \\ \underline{-65} \\ 0 \end{array}$$

Q=6.05

b.
$$\begin{array}{r} 2.35 \\ 17 \overline{)39.95} \\ \underline{-34} \\ 59 \\ \underline{-51} \\ 85 \\ \underline{-85} \\ 0 \end{array}$$

Q=2.35

c.
$$\begin{array}{r} 3.03 \\ 16 \overline{)48.48} \\ \underline{-48} \\ 048 \\ \underline{-48} \\ 0 \end{array}$$

Q=3.03

d.
$$\begin{array}{r} 12.36 \\ 12 \overline{)148.32} \\ \underline{-12} \\ 28 \\ \underline{-24} \\ 43 \\ \underline{-36} \\ 72 \\ \underline{-72} \\ 0 \end{array}$$

Q=12.36

5. a.
$$\begin{array}{r} 2.007 \\ 35 \overline{)70.245} \\ \underline{-70} \\ 0245 \\ \underline{-245} \\ 0 \end{array}$$

Q=2.007

b.
$$\begin{array}{r} 1.157 \\ 42 \overline{)48.594} \\ \underline{-42} \\ 65 \\ \underline{-42} \\ 239 \\ \underline{-210} \\ 294 \\ \underline{-294} \\ 0 \end{array}$$

Q=1.157

c.
$$\begin{array}{r} 0.0013 \\ 38 \overline{)0.0494} \\ \underline{-38} \\ 114 \\ \underline{-114} \\ 0 \end{array}$$

Q=0.0013

d.
$$\begin{array}{r} 0.2003 \\ 85 \overline{)17.0255} \\ \underline{-170} \\ 0255 \\ \underline{-255} \\ 0 \end{array}$$

Q=0.2003

6. a.
$$\begin{array}{r} 0.201 \\ 132 \overline{)26.532} \\ \underline{-264} \\ 132 \\ \underline{-132} \\ 0 \\ \hline Q=0.201 \end{array}$$

b.
$$\begin{array}{r} 1.629 \\ 305 \overline{)497} \\ \underline{-305} \\ 1920 \\ \underline{-1830} \\ 900 \\ \underline{-610} \\ 2900 \\ \underline{-2745} \\ 155 \\ \hline Q=1.63 \text{ approx} \end{array}$$

c.
$$\begin{array}{r} 0.303 \\ 265 \overline{)80.295} \\ \underline{-795} \\ 795 \\ \underline{-795} \\ 0 \\ \hline Q=0.303 \end{array}$$

d.
$$\begin{array}{r} 6.06855 \\ 14 \overline{)84.9597} \\ \underline{-84} \\ 095 \\ \underline{-84} \\ 0119 \\ \underline{-112} \\ 077 \\ \underline{-70} \\ 070 \\ \underline{-70} \\ 0 \\ \hline Q=6.06855 \end{array}$$

7. a.
$$\begin{array}{r} 1.224 \\ 8 \overline{)9.792} \\ \underline{-8} \\ 17 \\ \underline{-16} \\ 19 \\ \underline{-16} \\ 32 \\ \underline{-32} \\ 0 \\ \hline Q=1.224 \end{array}$$

b.
$$\begin{array}{r} 3.95 \\ 5 \overline{)19.75} \\ \underline{-15} \\ 47 \\ \underline{-45} \\ 25 \\ \underline{-25} \\ 0 \\ \hline Q=3.95 \end{array}$$

c.
$$\begin{array}{r} 0.025 \\ 7 \overline{)0.175} \\ \underline{-14} \\ 35 \\ \underline{-35} \\ 0 \\ \hline Q=0.025 \end{array}$$

d.
$$\begin{array}{r} 0.595 \\ 14 \overline{)8.33} \\ \underline{-70} \\ 133 \\ \underline{-126} \\ 70 \\ \underline{-70} \\ 0 \\ \hline Q=0.595 \end{array}$$

8. a.
$$\begin{array}{r} 39.1532 \\ 25 \overline{)978.83} \\ \underline{-75} \\ 228 \\ \underline{-225} \\ 38 \\ \underline{-25} \\ 133 \\ \underline{-125} \\ 80 \\ \underline{-75} \\ 50 \\ \underline{-50} \\ 0 \\ \hline Q=39.1532 \end{array}$$

b.
$$\begin{array}{r} 0.01048 \\ 15 \overline{)0.1572} \\ \underline{-15} \\ 072 \\ \underline{-60} \\ 120 \\ \underline{-120} \\ 0 \\ \hline Q=0.01048 \end{array}$$

c.
$$\begin{array}{r} 0.0100352 \\ 115 \overline{)1.154048} \\ \underline{-115} \\ 0404 \\ \underline{-345} \\ 598 \\ \underline{-575} \\ 230 \\ \underline{-230} \\ 0 \\ \hline Q=0.0100352 \end{array}$$

d.
$$\begin{array}{r} 0.00768 \\ 525 \overline{)4.032} \\ \underline{-3675} \\ 3570 \\ \underline{-3150} \\ 4200 \\ \underline{-4200} \\ 0 \\ \hline Q=0.00768 \end{array}$$

EXERCISE 10 E

1. a. 3.5 b. 0.04 c. 0.108 d. 0.0263 e. 4.305 f. 0.2827
 g. 0.04256 h. 0.0026 i. 5.3007 j. 0.26813 k. 0.07548 l. 0.006123
 m. 0.09 n. 0.005 o. 0.0045

2. a.
$$\begin{array}{r} 0.1755 \\ 20 \overline{) 3.51} \\ \underline{-20} \\ 151 \\ \underline{-140} \\ 110 \\ \underline{-100} \\ 100 \\ \underline{-100} \\ 0 \end{array} \quad \text{Q} = 0.1755$$

b.
$$\begin{array}{r} 0.405 \\ 90 \overline{) 36.45} \\ \underline{-360} \\ 450 \\ \underline{-450} \\ 0 \end{array} \quad \text{Q} = 0.405$$

c.
$$\begin{array}{r} 1.83 \\ 50 \overline{) 91.5} \\ \underline{-50} \\ 415 \\ \underline{-400} \\ 150 \\ \underline{-150} \\ 0 \end{array} \quad \text{Q} = 1.83$$

d.
$$\begin{array}{r} 2.83 \\ 30 \overline{) 84.9} \\ \underline{-60} \\ 249 \\ \underline{-240} \\ 90 \\ \underline{-90} \\ 0 \end{array} \quad \text{Q} = 2.83$$

3. a.
$$\begin{array}{r} 0.3128 \\ 800 \overline{) 250.24} \\ \underline{-2400} \\ 1024 \\ \underline{-800} \\ 2240 \\ \underline{-1600} \\ 6400 \\ \underline{-6400} \\ 0 \end{array} \quad \text{Q} = 0.3128$$

b.
$$\begin{array}{r} 0.0124 \\ 500 \overline{) 6.20} \\ \underline{-500} \\ 1200 \\ \underline{-1000} \\ 2000 \\ \underline{-2000} \\ 0 \end{array} \quad \text{Q} = 0.0124$$

c.
$$\begin{array}{r} 2.817 \\ 300 \overline{) 845.1} \\ \underline{-600} \\ 2451 \\ \underline{-2400} \\ 510 \\ \underline{-300} \\ 2100 \\ \underline{-2100} \\ 0 \end{array} \quad \text{Q} = 2.817$$

d.
$$\begin{array}{r} 2.502 \\ 200 \overline{) 500.4} \\ \underline{-400} \\ 1004 \\ \underline{-1000} \\ 400 \\ \underline{-400} \\ 0 \end{array} \quad \text{Q} = 2.502$$

EXERCISE 10 F

2. a. $0.9 \div 0.3$

$$= \frac{9}{10} \div \frac{3}{10} = \frac{9}{10} \times \frac{10}{3}$$

$$= \frac{9}{3} = 9 \div 3$$

$$\begin{array}{r} 3 \\ 3 \overline{) 9} \\ \underline{-9} \\ 0 \end{array} \quad \text{Q} = 3$$

b. $1.6 \div 0.4$

$$= \frac{16}{10} \div \frac{4}{10} = \frac{16}{10} \times \frac{10}{4}$$

$$= \frac{16}{4} = 16 \div 4$$

$$\begin{array}{r} 4 \\ 4 \overline{) 16} \\ \underline{-16} \\ 0 \end{array} \quad \text{Q} = 4$$

c. $6.4 \div 0.8$

$$= \frac{64}{10} \div \frac{8}{10} = \frac{64}{10} \times \frac{10}{8}$$

$$= \frac{64}{8} = 64 \div 8$$

$$\begin{array}{r} 8 \\ 8 \overline{) 64} \\ \underline{-64} \\ 0 \end{array} \quad \text{Q} = 8$$

2. a. $5.25 \div 2.5$
 Changing the divisor to a whole number.
 $= 52.5 \div 25$

$$\begin{array}{r} 2.1 \\ 25 \overline{) 52.5} \\ \underline{-50} \\ 25 \\ \underline{-25} \\ 0 \end{array} \quad \text{Q} = 2.1$$

b. $3.424 \div 1.6$
 Changing the divisor to a whole number.
 $= 34.24 \div 16$

$$\begin{array}{r} 2.14 \\ 16 \overline{) 34.24} \\ \underline{-32} \\ 22 \\ \underline{-16} \\ 64 \\ \underline{-64} \\ 0 \end{array} \quad \text{Q} = 2.14$$

c. $0.0598 \div 2.6$
 Changing the divisor to a whole number.
 $= 0.598 \div 26$

$$\begin{array}{r} 0.023 \\ 26 \overline{) 0.598} \\ \underline{-52} \\ 78 \\ \underline{-78} \\ 0 \end{array} \quad \text{Q} = 0.023$$

3. a. $136.5 \div 0.15$
Changing the divisor
to a whole number.

$$= 13650 \div 15$$

$$\begin{array}{r} 910 \\ 15 \overline{) 13650} \\ \underline{-135} \\ 15 \\ \underline{-15} \\ 00 \\ \underline{-0} \\ 0 \end{array}$$

Q = 910

- b. $0.7 \div 0.035$
Changing the divisor
to a whole number.

$$= 700 \div 35$$

$$\begin{array}{r} 20 \\ 35 \overline{) 700} \\ \underline{-70} \\ 00 \\ \underline{-0} \\ 0 \end{array}$$

Q = 20

- c. $16.8 \div 0.84$
Changing the divisor
to a whole number.

$$= 1680 \div 84$$

$$\begin{array}{r} 20 \\ 84 \overline{) 1680} \\ \underline{-168} \\ 00 \\ \underline{-0} \\ 0 \end{array}$$

Q = 20

4. a. $9 \div 0.6$
Changing the divisor
to a whole number.

$$= 90 \div 6$$

$$\begin{array}{r} 15 \\ 6 \overline{) 90} \\ \underline{-6} \\ 30 \\ \underline{-30} \\ 0 \end{array}$$

Q = 15

- b. $24 \div 0.08$
Changing the divisor
to a whole number.

$$= 2400 \div 8$$

$$\begin{array}{r} 300 \\ 8 \overline{) 2400} \\ \underline{-24} \\ 000 \end{array}$$

Q = 300

- c. $168 \div 0.16$
Changing the divisor
to a whole number.

$$= 16800 \div 16$$

$$\begin{array}{r} 1050 \\ 16 \overline{) 16800} \\ \underline{-16} \\ 080 \\ \underline{-80} \\ 00 \end{array}$$

Q = 1050

5. a. $3 \div 0.4$
Changing the divisor
to a whole number.

$$= 30 \div 4$$

$$\begin{array}{r} 7.5 \\ 4 \overline{) 30} \\ \underline{-28} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

Q = 7.5

- b. $6 \div 1.5$
Changing the divisor
to a whole number.

$$= 60 \div 15$$

$$\begin{array}{r} 4 \\ 15 \overline{) 60} \\ \underline{-60} \\ 0 \end{array}$$

Q = 4

- c. $14 \div 0.035$
Changing the divisor
to a whole number.

$$= 14000 \div 35$$

$$\begin{array}{r} 400 \\ 35 \overline{) 14000} \\ \underline{-140} \\ 000 \end{array}$$

Q = 400

EXERCISE 10 G

1. a. $3 \div 6$

$$\begin{array}{r} 0.5 \\ 6 \overline{) 3.0} \\ \underline{-30} \\ 0 \end{array}$$

Q = 0.5

- b. $4 \div 16$

$$\begin{array}{r} 0.25 \\ 16 \overline{) 4.0} \\ \underline{-32} \\ 80 \\ \underline{-80} \\ 0 \end{array}$$

Q = 0.25

- c. $143 \div 26$

$$\begin{array}{r} 5.5 \\ 26 \overline{) 143} \\ \underline{-130} \\ 130 \\ \underline{-130} \\ 0 \end{array}$$

Q = 5.5

- d. $55 \div 22$

$$\begin{array}{r} 2.5 \\ 22 \overline{) 55} \\ \underline{-44} \\ 110 \\ \underline{-110} \\ 0 \end{array}$$

Q = 2.5

2. a. $4 \div 50$

$$\begin{array}{r} 0.08 \\ 50 \overline{) 4.00} \\ \underline{-400} \\ 0 \\ \hline \end{array}$$

Q=0.08

b. $19 \div 76$

$$\begin{array}{r} 0.25 \\ 76 \overline{) 19.0} \\ \underline{-152} \\ 380 \\ \underline{-380} \\ 0 \\ \hline \end{array}$$

Q=0.25

c. $15 \div 75$

$$\begin{array}{r} 0.2 \\ 75 \overline{) 15.0} \\ \underline{-150} \\ 0 \\ \hline \end{array}$$

Q=0.2

d. $250 \div 500$

$$\begin{array}{r} 0.5 \\ 500 \overline{) 2500} \\ \underline{-2500} \\ 0 \\ \hline \end{array}$$

Q=0.5

3. a. $\frac{4}{5} = 4 \div 5$

$$\begin{array}{r} 0.8 \\ 5 \overline{) 4.0} \\ \underline{-40} \\ 0 \\ \hline \end{array}$$

Q=0.8

3. b. $\frac{1}{20} = 1 \div 20$

$$\begin{array}{r} 0.05 \\ 20 \overline{) 1.00} \\ \underline{-100} \\ 0 \\ \hline \end{array}$$

Q=0.05

3. c. $\frac{1}{10} = 1 \div 10$

$$\begin{array}{r} 0.1 \\ 10 \overline{) 1.0} \\ \underline{-10} \\ 0 \\ \hline \end{array}$$

Q=0.1

3. d. $\frac{1}{5} = 1 \div 5$

$$\begin{array}{r} 0.2 \\ 5 \overline{) 1.0} \\ \underline{-10} \\ 0 \\ \hline \end{array}$$

Q=0.2

3. e. $\frac{1}{8} = 1 \div 8$

$$\begin{array}{r} 0.125 \\ 8 \overline{) 1.000} \\ \underline{-8} \\ 20 \\ \underline{-16} \\ 40 \\ \underline{-40} \\ 0 \\ \hline \end{array}$$

Q=0.125

4. a. $\frac{3}{5} = 3 \div 5$

$$\begin{array}{r} 0.6 \\ 5 \overline{) 3.0} \\ \underline{-30} \\ 0 \\ \hline \end{array}$$

Q=0.6

4. b. $\frac{4}{8} = 4 \div 8$

$$\begin{array}{r} 0.5 \\ 8 \overline{) 4.0} \\ \underline{-40} \\ 0 \\ \hline \end{array}$$

Q=0.5

4. c. $\frac{16}{25} = 16 \div 25$

$$\begin{array}{r} 0.64 \\ 25 \overline{) 16.00} \\ \underline{-150} \\ 100 \\ \underline{-100} \\ 0 \\ \hline \end{array}$$

Q=0.64

4. d. $\frac{5}{8} = 5 \div 8$

$$\begin{array}{r} 0.625 \\ 8 \overline{) 5.000} \\ \underline{-48} \\ 20 \\ \underline{-16} \\ 40 \\ \underline{-40} \\ 0 \\ \hline \end{array}$$

Q=0.625

4. e. $\frac{22}{25} = 22 \div 25$

$$\begin{array}{r} 0.88 \\ 25 \overline{) 22.00} \\ \underline{-200} \\ 200 \\ \underline{-200} \\ 0 \\ \hline \end{array}$$

Q=0.88

5. a. $\frac{3}{30} = 3 \div 30$

$$\begin{array}{r} 0.1 \\ 30 \overline{) 3.0} \\ \underline{-30} \\ 0 \\ \hline \end{array}$$

Q=0.1

5. b. $\frac{21}{50} = 21 \div 50$

$$\begin{array}{r} 0.42 \\ 50 \overline{) 21.00} \\ \underline{-200} \\ 100 \\ \underline{-100} \\ 0 \\ \hline \end{array}$$

Q=0.42

5. c. $\frac{16}{40} = 16 \div 40$

$$\begin{array}{r} 0.4 \\ 40 \overline{) 16.0} \\ \underline{-160} \\ 0 \\ \hline \end{array}$$

Q=0.4

5. d. $\frac{11}{25} = 11 \div 25$

$$\begin{array}{r} 0.44 \\ 25 \overline{) 11.00} \\ \underline{-100} \\ 100 \\ \underline{-100} \\ 0 \\ \hline \end{array}$$

Q=0.44

5. e. $\frac{8}{125} = 8 \div 125$

$$\begin{array}{r} 0.064 \\ 125 \overline{) 8.000} \\ \underline{-750} \\ 500 \\ \underline{-500} \\ 0 \\ \hline \end{array}$$

Q=0.064

$$6. \text{ a. } 3\frac{1}{8} = \frac{25}{8}$$

$$= 25 \div 8$$

$$\begin{array}{r} 3.125 \\ 8 \overline{) 25.000} \\ \underline{-24} \\ 10 \\ \underline{-8} \\ 20 \\ \underline{-16} \\ 40 \\ \underline{-40} \\ 0 \\ \hline \text{Q} = 3.125 \end{array}$$

$$6. \text{ b. } 7\frac{2}{5} = \frac{37}{5}$$

$$= 37 \div 5$$

$$\begin{array}{r} 7.4 \\ 5 \overline{) 37.0} \\ \underline{-35} \\ 20 \\ \underline{-20} \\ 0 \\ \hline \text{Q} = 7.4 \end{array}$$

$$6. \text{ c. } 11\frac{1}{4} = \frac{45}{4}$$

$$= 45 \div 4$$

$$\begin{array}{r} 11.25 \\ 4 \overline{) 45} \\ \underline{-4} \\ 05 \\ \underline{-4} \\ 10 \\ \underline{-8} \\ 20 \\ \underline{-20} \\ 0 \\ \hline \text{Q} = 11.25 \end{array}$$

$$6. \text{ d. } 14\frac{3}{25} = \frac{353}{25} = 353 \div 25$$

$$\begin{array}{r} 14.12 \\ 25 \overline{) 353} \\ \underline{-25} \\ 103 \\ \underline{-100} \\ 30 \\ \underline{-25} \\ 50 \\ \underline{-50} \\ 0 \\ \hline \text{Q} = 14.12 \end{array}$$

$$6. \text{ e. } 30\frac{17}{20} = \frac{617}{20} = 617 \div 20$$

$$\begin{array}{r} 30.85 \\ 20 \overline{) 617} \\ \underline{-60} \\ 170 \\ \underline{-160} \\ 100 \\ \underline{-100} \\ 0 \\ \hline \text{Q} = 30.85 \end{array}$$

EXERCISE 10 H

1. Mr. Vats runs in 1 hour = 3.37 km
 He runs in 12 hours = 3.37×12 km
 = 40.44 km
 Thus, Mr. Vats runs 40.44 km in 12 hours.

$$\begin{array}{r} 337 \\ \times 12 \\ \hline 674 \\ 337 \\ \hline 4044 \end{array}$$

2. Saloni fills water in 1 minute = 7.82 l
 She fills water in 15 minutes = 7.82×15 l
 = 117.3 l
 Thus, Saloni can fill 117.3 l of water in 15 minutes.

$$\begin{array}{r} 782 \\ \times 15 \\ \hline 3910 \\ 782 \\ \hline 11730 \end{array}$$

3. Car covers distance in 1 hour = 68.52 km
 Car covers distance in 15.5 hours = 68.52×15.5 km
 = 1062.06 km
 Thus, car can covers 1062.06 km in 15.5 hours.

$$\begin{array}{r} 6852 \\ \times 155 \\ \hline 34260 \\ 3426 \\ 6852 \\ \hline 1062060 \end{array}$$

4. Quantity of oil = 112 l
 Capacity of 1 bottle = 3.5 l
 Number of bottles = $112 \div 3.5$
 = 32
 Thus, 32 bottles will be needed.

$$112 \div 3.5 = 1120 \div 35$$

$$\begin{array}{r} 32 \\ 35 \overline{) 1120} \\ \underline{-105} \\ 70 \\ \underline{-70} \\ 0 \end{array}$$

5. Train covers distance = 220.55 km
 Train takes time = 5.5 hrs
 Speed of train = $220.55 \div 5.5$ km/hr.
 = 40.1 km/hr.
 Thus, the speed of train is 40.1 km/hr.

$$220.55 \div 5.5 = 22055 \div 550$$

$$\begin{array}{r} 40.1 \\ 550 \overline{) 22055} \\ \underline{-2200} \\ 550 \\ \underline{-550} \\ 0 \end{array}$$

6. Length of ribbon = 781.28 m
 Number of pieces = 16
 Length of each piece = $781.28 \div 16$ m
 = 48.83 m
 Thus, the length of each piece is 48.83 m.

$$16 \overline{) 781.28}$$

$$\begin{array}{r} 48.83 \\ 16 \overline{) 781.28} \\ \underline{-64} \\ 141 \\ \underline{-128} \\ 132 \\ \underline{-128} \\ 48 \\ \underline{-48} \\ 0 \end{array}$$

7. Divisor = 7
 Quotient = 65.2
 Dividend = ?
 Dividend = divisor \times quotient = $7 \times 65.2 = 456.4$
 Thus, the number is 456.4.

$$\begin{array}{r} 652 \\ \times 7 \\ \hline 4564 \end{array}$$

$$\therefore 7 \times 65.2 = 456.4$$

8. One number = 0.05
 Product = 0.0465
 Other number = Product \div one number
 = $0.0465 \div 0.05 = 0.93$
 Thus, the number is 0.93.

$$0.0465 \div 0.05 = 4.65 \div 5$$

$$\begin{array}{r} 0.93 \\ 5 \overline{) 4.65} \\ \underline{-45} \\ 15 \\ \underline{-15} \\ 0 \end{array}$$

PRACTICE SHEET-2

1. a. 500, 150 b. yes c. $\frac{6}{7}, \frac{96}{108}$ d. $3\frac{1}{8}$ e. 28
 f. 9, 2, 3, 0, 6 g. 2, 7, 2 h. 7.9, 6.7
 i. 6.4289, 0.3456, 0.072 j. 53.4, 6.32, 48750 k. 4.75
 l. 0.05

$$\begin{array}{r|l}
 2 & 420 \\
 \hline
 2 & 210 \\
 \hline
 3 & 105 \\
 \hline
 5 & 35 \\
 \hline
 7 & 7 \\
 \hline
 & 1
 \end{array}$$

$$\therefore 420 = 2 \times 2 \times 3 \times 5 \times 7$$

$$\begin{array}{r|l}
 2 & 54 \\
 \hline
 3 & 27 \\
 \hline
 3 & 9 \\
 \hline
 3 & 3 \\
 \hline
 & 1
 \end{array}$$

$$\therefore 54 = 2 \times 3 \times 3 \times 3$$

3. a. HCF of 18, 72 and 108

$$\begin{array}{r|l}
 2 & 18, 72, 108 \\
 \hline
 3 & 9, 36, 54 \\
 \hline
 3 & 3, 12, 18 \\
 \hline
 & 1, 4, 6
 \end{array}$$

$$\therefore \text{HCF} = 2 \times 3 \times 3 = 18$$

- b. HCF of 36 and 60

$$\begin{array}{r|l}
 2 & 36, 60 \\
 \hline
 2 & 18, 30 \\
 \hline
 3 & 9, 15 \\
 \hline
 & 3, 5
 \end{array}$$

$$\therefore \text{HCF} = 2 \times 2 \times 3 = 12$$

4. a. HCF of 60, 125 and 375

$$\begin{array}{r|l}
 2 & 60, 125, 375 \\
 \hline
 2 & 30, 125, 375 \\
 \hline
 3 & 15, 125, 375 \\
 \hline
 5 & 5, 125, 125 \\
 \hline
 5 & 1, 25, 25 \\
 \hline
 5 & 1, 5, 5 \\
 \hline
 & 1, 1, 1
 \end{array}$$

$$\therefore \text{LCM} = 2 \times 2 \times 3 \times 5 \times 5 \times 5 = 1500$$

- b. HCF of 12, 18 and 36

$$\begin{array}{r|l}
 2 & 12, 18, 36 \\
 \hline
 2 & 6, 9, 18 \\
 \hline
 3 & 3, 9, 9 \\
 \hline
 3 & 1, 3, 3 \\
 \hline
 & 1, 1, 1
 \end{array}$$

$$\therefore \text{LCM} = 2 \times 2 \times 3 \times 3 = 36$$

5. a. 4.01, 4.04, 4.1, 4.401, 4.014

Equivalent decimal numbers : 4.010, 4.040, 4.100, 4.401, 4.014

In descending order : 4.401, 4.100, 4.040, 4.014, 4.010

or 4.401, 4.1, 4.04, 4.014, 4.01

- b. 0.035, 0.305, 0.5, 0.35

Equivalent decimal numbers : 0.035, 0.305, 0.500, 0.350

In descending order : 0.500, 0.350, 0.305, 0.035 or 0.5, 0.35, 0.305, 0.035

6. a. $6\frac{2}{7} \times \frac{21}{22} = \frac{44}{7} \times \frac{21}{22} = \frac{2\cancel{44} \times 21^3}{\cancel{7} \times \cancel{22} 1} = 2 \times 3 = 6$

b. $\frac{14}{45} \div 7 = \frac{14}{45} \div \frac{7}{1} = \frac{14}{45} \times \frac{1}{7} = \frac{2\cancel{14} \times 1}{45 \times \cancel{7} 1} = \frac{2}{45}$

c. $3\frac{5}{7} \div 2\frac{1}{3} = \frac{26}{7} \div \frac{7}{3} = \frac{26}{7} \times \frac{3}{7} = \frac{26 \times 3}{7 \times 7} = \frac{78}{49} = 1\frac{29}{49}$

d. $10 - 2\frac{3}{4} - 3\frac{5}{8} - \frac{11}{8} = \frac{10}{1} - \frac{11}{4} - \frac{29}{8} + \frac{11}{8}$
 $= \frac{8 \times 10 - 2 \times 11 - 1 \times 29 + 1 \times 11}{8} = \frac{80 - 22 - 29 + 11}{8}$
 $= \frac{91 - 51}{8} = \frac{40}{8} = 5$

7. a. $365 - 42.857$

$$\begin{array}{r} 365.000 \\ - 42.857 \\ \hline 322.143 \end{array}$$

b. $19.2 + 171.35 + 450 + 8.163$

$$\begin{array}{r} 19.200 \\ + 171.350 \\ + 150.000 \\ + 8.163 \\ \hline 648.713 \end{array}$$

8. a. 5.83×2.064

$$\begin{array}{r} 2064 \\ \times 583 \\ \hline 6192 \\ 16512 \\ 10320 \\ \hline 1203312 \end{array}$$

Product = 12.03312

b. 0.392×43

$$\begin{array}{r} 392 \\ \times 43 \\ \hline 1176 \\ 1568 \\ \hline 16856 \end{array}$$

Product = 16.856

c. $9.545 \div 0.23 = 954.5 \div 23$

$$\begin{array}{r} 41.5 \\ 23 \overline{) 954.5} \\ \underline{-92} \\ 34 \\ \underline{-23} \\ 115 \\ \underline{-115} \\ 0 \end{array}$$

Q = 41.5

d. $0.639 \div 9$

$$\begin{array}{r} 0.071 \\ 9 \overline{) 0.639} \\ \underline{-63} \\ 09 \\ \underline{-9} \\ 0 \end{array}$$

Q = 0.071

9. Divisor = $3\frac{5}{6} = \frac{23}{6}$

Quotient = $\frac{3}{4}$

Dividend = ?

Dividend = divisor \times quotient

$$= \frac{23}{6} \times \frac{3}{4} = \frac{23 \times \cancel{3}^1}{2 \cancel{6} \times 4} = \frac{23 \times 1}{2 \times 4} = \frac{23}{8} = 2\frac{7}{8}$$

Thus, the number is $2\frac{7}{8}$.

10. Number of sandwich = 12

$$\text{Tushar eat} = \frac{1}{6} \text{ of } 12 = \frac{1}{6} \times 12 = \frac{1 \times \cancel{12}^2}{\cancel{6}_1} = 2$$

Left sandwiches = $12 - 2 = 10$

Thus, 10 sandwiches were left.

EXERCISE 11 A

1.
 - a. The digit to the right of the tens place in 32 is 2. And $2 < 5$.
∴ 32 rounded off to the nearest ten is 30.
 - b. The digit to the right of the tens place in 79 is 9. And $9 > 5$.
∴ 79 rounded off to the nearest ten is 80.
 - c. The digit to the right of the tens place in 125 is 5.
∴ 125 rounded off to the nearest ten is 130.
 - d. The digit to the right of the tens place in 872 is 2. And $2 < 5$.
∴ 872 rounded off to the nearest ten is 870.
 - e. The digit to the right of the tens place in 2275 is 5.
∴ 2275 rounded off to the nearest ten is 2280.
 - f. The digit to the right of the tens place in 5680 is 0.
∴ 5680 rounded off to the nearest ten is 5680.
 - g. The digit to the right of the tens place in 23,758 is 8. And $8 > 5$.
∴ 23,758 rounded off to the nearest ten is 23760.
 - h. The digit to the right of the tens place in 48862 is 2. And $2 < 5$.
∴ 48862 rounded off to the nearest ten is 48860.
2.
 - a. The digit to the right of the hundreds place in 470 is 7. And $7 > 5$.
∴ 470 rounded off to the nearest hundred is 500.
 - b. The digit to the right of the hundreds place in 857 is 5.
∴ 857 rounded off to the nearest hundred is 900.
 - c. The digit to the right of the hundreds place in 2783 is 8. And $8 > 5$.
∴ 2783 rounded off to the nearest hundred is 2800.
 - d. The digit to the right of the hundreds place in 36785 is 8. And $8 > 5$.
∴ 36785 rounded off to the nearest hundred is 36800.
 - e. The digit to the right of the hundreds place in 414975 is 7. And $7 > 5$.
∴ 414975 rounded off to the nearest hundred is 415000.
 - f. The digit to the right of the hundreds place in 6323093 is 9. And $9 > 5$.
∴ 6323093 rounded off to the nearest hundred is 6323100.
3.
 - a. The digit to the right of the thousands place in 6754 is 7. And $7 > 5$.
∴ 6754 rounded off to the nearest thousand is 7000.
 - b. The digit to the right of the thousands place in 7389 is 3. And $3 < 5$.
∴ 7389 rounded off to the nearest thousand is 7000.
 - c. The digit to the right of the thousands place in 27560 is 5.
∴ 27560 rounded off to the nearest thousand is 28000.
 - d. The digit to the right of the thousands place in 86258 is 2. And $2 > 5$.
∴ 86258 rounded off to the nearest thousand is 86000.
 - e. The digit to the right of the thousands place in 820843 is 8. And $8 > 5$.
∴ 820843 rounded off to the nearest thousand is 821000.

- f. The digit to the right of the thousands place in 69359888 is 8. And $8 > 5$.
 \therefore 69359888 rounded off to the nearest thousand is 69360000.
4. a. The digit to the right of the ten thousands place in 67,859 is 7. And $7 > 5$.
 \therefore 67,859 rounded off to the nearest ten thousand is 70,000.
 The digit to the right of the ten thousands place in 3,43,586 is 3. And $3 < 5$.
 \therefore 3,43,586 rounded off to the nearest ten thousand is 3,40,000.
- b. The digit to the right of the lakhs place in 72,83,6949 is 8. And $8 > 5$.
 \therefore 72,83,694 rounded off to the nearest lakh is 73,00,000.
 The digit to the right of the lakhs place in 2,66,77,345 is 7. And $7 < 5$.
 \therefore 2,66,77,345 rounded off to the nearest lakh is 2,67,00,000.
- c. The digit to the right of the crores place in 7,08,58,497 is 0.
 \therefore 7,08,58,497 rounded off to the nearest crore is 7,00,00,000.
 The digit to the right of the crores place in 42,75,69,861 is 7. And $7 < 5$.
 \therefore 42,75,69,861 rounded off to the nearest crore is 43,00,00,000.
5. a. 47,37,000 b. 47,40,000 c. 47,00,000 d. 50,00,000
6. c 7. a 8. a

EXERCISE 11 B

1. a. The digit to the right of the ones place in 1.8 is 8. And $8 < 5$.
 \therefore 1.8 rounded off to the nearest one is 2.
- b. The digit to the right of the ones place in 2.3 is 3. And $3 < 5$.
 \therefore 2.3 rounded off to the nearest one is 2.
- c. The digit to the right of the ones place in 4.08 is 0.
 \therefore 4.08 rounded off to the nearest one is 4.
- d. The digit to the right of the ones place in 0.85 is 8. And $8 > 5$.
 \therefore 0.85 rounded off to the nearest one is 1.
- e. The digit to the right of the ones place in 14.65 is 6. And $6 > 5$.
 \therefore 14.65 rounded off to the nearest one is 15.
- f. The digit to the right of the ones place in 24.92 is 9. And $9 > 5$.
 \therefore 24.92 rounded off to the nearest one is 25.
- g. The digit to the right of the ones place in 49.7 is 7. And $7 > 5$.
 \therefore 49.7 rounded off to the nearest one is 50.
- h. The digit to the right of the ones place in 99.99 is 9. And $9 > 5$.
 \therefore 99.99 rounded off to the nearest one is 100.
2. Rounding off to one place of decimal (rounding off to the nearest tenth):
- a. As $7 > 5$, 3.07 \rightarrow 3.1
- b. As $3 > 5$, 4.93 \rightarrow 4.9
- c. As $8 > 5$, 28.68 \rightarrow 28.7
- d. As $7 > 5$, 46.87 \rightarrow 46.9
- e. As $6 > 5$, 270.962 \rightarrow 271.0
- f. The digit to the right of the tenth place in 2542.555 is 5.
 \therefore 2542.555 \rightarrow 2542.6

3. Rounding off to second decimal place (rounding off to the nearest hundredth) :

- a. As $3 > 5$, $4.363 \rightarrow 4.36$
- b. As $9 > 5$, $0.509 \rightarrow 0.51$
- c. As $3 > 5$, $0.8035 \rightarrow 0.80$
- d. The digit to the right of the hundredth place in 57.545 is 5.
 $\therefore 57.545 \rightarrow 57.55$
- e. As $6 > 5$, $205.096 \rightarrow 205.10$
- f. As $7 > 5$, $34585.0372 \rightarrow 34585.04$

4. Rounding off to three place of decimal (rounding off to the nearest thousandth) :

- a. As $7 > 5$, $1.2687 \rightarrow 1.269$
- b. As $1 > 5$, $6.5051 \rightarrow 6.505$
- c. As $9 > 5$, $57.3489 \rightarrow 57.349$
- d. As $7 > 5$, $143.0047 \rightarrow 143.005$
- e. As $7 > 5$, $512.3497 \rightarrow 512.350$
- f. As $8 > 5$, $8573.5008 \rightarrow 8573.501$

5. a.
$$\begin{array}{r} 6.33 \\ 3 \overline{)19} \\ \underline{-18} \\ 10 \\ \underline{-9} \\ 10 \\ \underline{-9} \\ 1 \end{array}$$

The digit to the right of the first decimal place in the quotient is 3
 As $3 < 5$, $Q = 6.3$

5. b.
$$\begin{array}{r} 2.456 \\ 7 \overline{)17.193} \\ \underline{-14} \\ 31 \\ \underline{-28} \\ 39 \\ \underline{-35} \\ 43 \\ \underline{-42} \\ 1 \end{array}$$

The digit to the right of the first decimal place in the quotient is 5
 $Q = 2.5$

5. c.
$$\begin{array}{r} 1.375 \\ 8 \overline{)11} \\ \underline{-8} \\ 30 \\ \underline{-24} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

The digit to the right of the first decimal place in the quotient is 7
 As $7 < 5$, $Q = 1.4$

6. a.
$$\begin{array}{r} 2.166 \\ 6 \overline{)13} \\ \underline{-12} \\ 10 \\ \underline{-6} \\ 40 \\ \underline{-36} \\ 40 \\ \underline{-36} \\ 4 \end{array}$$

The digit to the right of the second decimal place in the quotient is 6
 As $6 > 5$, $Q = 2.17$

$$\begin{array}{r}
 6. \quad b. \quad \frac{0.488}{11 \overline{)5.37}} \\
 \underline{-44} \\
 97 \\
 \underline{-88} \\
 90 \\
 \underline{-88} \\
 2
 \end{array}$$

The digit to the right of the first decimal place in the quotient is 7
As $7 < 5$, $Q = 0.49$

$$\begin{array}{r}
 6. \quad c. \quad \frac{2.142}{7 \overline{)15}} \\
 \underline{-14} \\
 10 \\
 \underline{-7} \\
 30 \\
 \underline{-28} \\
 20 \\
 \underline{-14} \\
 6
 \end{array}$$

The digit to the right of the second decimal place in the quotient is 2
As $2 > 5$, $Q = 2.14$

$$\begin{array}{r}
 7. \quad a. \quad \frac{0.2392}{9 \overline{)2.153}} \\
 \underline{-18} \\
 35 \\
 \underline{-27} \\
 83 \\
 \underline{-81} \\
 20 \\
 \underline{-18} \\
 2
 \end{array}$$

The digit to the right of the three place of decimal in the quotient is 2
As $2 < 5$, $Q = 0.239$

$$\begin{array}{r}
 7. \quad b. \quad \frac{1.3076}{13 \overline{)17}} \\
 \underline{-13} \\
 40 \\
 \underline{-39} \\
 100 \\
 \underline{-91} \\
 90 \\
 \underline{-78} \\
 12
 \end{array}$$

The digit to the right of the three place of decimal in the quotient is 6
As $6 < 5$, $Q = 1.308$

$$\begin{array}{r}
 7. \quad c. \quad \frac{1.4375}{16 \overline{)23}} \\
 \underline{-16} \\
 70 \\
 \underline{-64} \\
 60 \\
 \underline{-48} \\
 120 \\
 \underline{-112} \\
 80 \\
 \underline{-80} \\
 0
 \end{array}$$

The digit to the right of the three place of decimal in the quotient is 5
 $Q = 1.438$

EXERCISE 12 A

1. a. $31 \text{ out of } 100 = \frac{31}{100} = \frac{31}{100} \times 100\% = 31\%$
 b. $45 \text{ out of } 100 = \frac{45}{100} = \frac{45}{100} \times 100\% = 45\%$
 c. $18 \text{ out of } 30 = \frac{18}{30} = \frac{18}{30} \times 100\% = 60\%$
 d. $\frac{17}{100} = \frac{17}{100} \times 100\% = 17\%$
 e. $\frac{29}{100} = \frac{29}{100} \times 100\% = 29\%$
 f. $\frac{5}{10} = \frac{5}{10} \times 100\% = 50\%$
 g. $\frac{31}{100} = \frac{31}{100} \times 100\% = 31\%$
 h. $\frac{3}{5} = \frac{3}{5} \times 100\% = 60\%$
 i. $\frac{7}{8} = \frac{7}{8} \times 100\% = \frac{700}{8}\% = 87\frac{4}{8}\% = 87\frac{1}{2}\%$
 j. $\frac{13}{25} = \frac{13}{25} \times 100\% = 52\%$
 k. $0.8 = \frac{8}{10} = \frac{8}{10} \times 100\% = 80\%$
 l. $0.08 = \frac{8}{100} = \frac{8}{100} \times 100\% = 8\%$

2. a. $25\% = \frac{25}{100} = \frac{1}{4}$
 b. $6.25\% = \frac{625}{100}\% = \frac{625}{100 \times 100} = \frac{1}{4 \times 4} = \frac{1}{16}$
 c. $12\frac{1}{2}\% = \frac{25}{2}\% = \frac{25}{2 \times 100} = \frac{1}{2 \times 4} = \frac{1}{8}$

3. a. $9\% = \frac{9}{100} = 0.09$
 b. $27\% = \frac{27}{100}\% = 0.27$
 c. $77\frac{1}{2}\% = \frac{155}{2}\% = \frac{155}{2 \times 100} = 0.775$

4. a. $11\frac{1}{2}\% \text{ of } 420 \text{ l} = \frac{35}{3}\% \text{ of } 420 \text{ l} = \frac{35 \times 420}{3 \times 100} = 49 \text{ l}$ F
 b. $30\% \text{ of } 750 \text{ km} = \frac{30 \times 750}{100} = 225 \text{ km}$ T
 c. $40\% \text{ of } ₹ 165 = \frac{40 \times 165}{100} = ₹ 66$ T
 d. $10\% \text{ of } 70 = \frac{10 \times 70}{100} = 7$ F
 e. $500 \text{ ml} = \frac{500 \times 100}{1000}\% = 50\% \text{ of a litre}$ T
 f. $300 \text{ m} = \frac{300 \times 100}{1000}\% = 30\% \text{ of a km}$ F
 g. $40 \text{ cm} = \frac{40 \times 100}{100}\% = 40\% \text{ of a metre}$ F
 h. $15 \text{ paise} = \frac{15 \times 100}{100}\% = 15\% \text{ of a rupee}$ T

5. a. 40% of $225 = \frac{40 \times 225}{100} = 90$ $<$ 20% of $460 = \frac{20 \times 460}{100} = 92$
 b. 20% of $25 = \frac{20 \times 25}{100} = 5$ $=$ 25% of $20 = \frac{25 \times 20}{100} = 5$
 c. 36% of $450 \text{ ml} = \frac{36 \times 450}{100} = 162 \text{ ml}$ $=$ 45% of $360 \text{ ml} = \frac{45 \times 360}{100} = 162 \text{ ml}$
 d. 6% of $\text{₹ } 550 = \frac{6 \times 550}{100} = \text{₹ } 33$ $>$ 10% of $\text{₹ } 320 = \frac{10 \times 320}{100} = \text{₹ } 32$

EXERCISE 12 B

1. Vipin gets per month = ₹ 500
 He spends = 80% of ₹ 500 = $\frac{80 \times 500}{100} = \text{₹ } 400$
 So, Vipin spends ₹ 400 every month.
2. Shikha spent on dress = 90% of ₹ 560 = $\frac{90 \times 560}{100} = \text{₹ } 504$
 So, Shikha's dress is ₹ 504.
3. Students present in school on Monday = 80% of the 1250
 = $\frac{80 \times 1250}{100} = 1000$
 So, 1000 students were present on Monday.
4. Maximum marks in the examination = 540
 Neeraj scores = 75% of 540
 = $\frac{75 \times 540}{100} = 405$
 So, Neeraj scores 405 marks in the examination.
5. Ravi weighs = 75 kg
 Harsh weighs = 60% of 75 kg
 = $\frac{60 \times 75}{100} \text{ kg} = 45 \text{ kg}$
 So, Harsh weight is 45 kg.
6. Fruit seller sells fruits in a day = 80 kg
 Sell of apples = 30% of 80 kg
 = $\frac{30 \times 80}{100} \text{ kg} = 24 \text{ kg}$.
 So, the weight of apples is 24 kg.
7. Mr Bansal buy a mobile phone = ₹ 16,400
 He sold it = ₹ 13,120
 $\therefore \text{CP} > \text{SP}$, there is loss
 $\therefore \text{loss} = \text{₹ } 16,400 - \text{₹ } 13,120 = \text{₹ } 3280$
 Mr Bansal spent ₹ 16,400 but sold at a loss of ₹ 3280.
 \therefore his loss was ₹ 3280 per ₹ 16,400
 Now, $3280 \text{ per } 16400 = \frac{3280}{16400} = \frac{1}{5} = \frac{1}{5} \times 100\% = 20\%$
 So, his loss per cent was 20%.

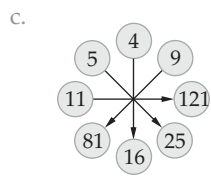
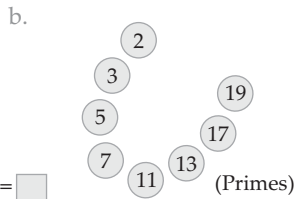
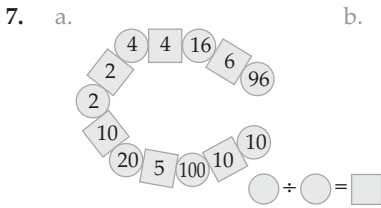
8. Cost of 1 bag = ₹ 250
 Cost of 4 bags = ₹ 250 × 4 = ₹ 1000
 Shikhar sold them = ₹ 275 × 4 = ₹ 1100
 ∴ SP > CP, there is profit
 ∴ profit = ₹ 1100 – ₹ 1000 = ₹ 100
 Shikhar spent ₹ 1000 and made a profit of ₹ 100.
 ∴ he made a profit of ₹ 100 per ₹ 1000
 Now, 100 per 1000 = $\frac{100}{1000} = \frac{1}{10} = \frac{1}{10} \times 100\% = 10\%$
 So, his profit per cent was 10%.

Chapter 13 Patterns

EXERCISE 13

1. a. (0.001) (0.01) (0.1) (1) (10) (100) Rule A number = previous number × 10
 b. (990) (99) (9.9) (.99) (.099) (.0099) Rule A number = previous number ÷ 10
 c. ($\frac{1}{4}$) ($\frac{1}{2}$) ($\frac{3}{4}$) (1) ($\frac{5}{4}$) ($\frac{3}{2}$) Rule A number = previous number + $\frac{1}{4}$
 d. ($\frac{2}{2}$) (2) ($\frac{1}{2}$) (1) ($\frac{1}{2}$) (0) Rule A number = previous number – $\frac{1}{2}$
 e. ($\frac{7}{81}$) ($\frac{7}{27}$) ($\frac{7}{9}$) ($\frac{7}{3}$) (7) (21) Rule A number = previous number × 3
2. a. [4] +10 [14] +14 [28] +18 [46] +22 [68] +26 [94] +30 [124]
 b. [6] +16 [22] +24 [46] +32 [78] +40 [118] +48 [166] +56 [222]
 c. [10] +9 [19] +11 [30] +13 [43] +15 [58] +17 [75] +19 [94]
3. Rule : (number × number) – (previous number × previous number)
 = number + previous number
 (6 × 6) – (5 × 5) = 11
 (9 × 9) – (8 × 8) = 17
4. Rule : Sum = (number of numbers) × (number of numbers)
 Sum of the first 7 odd numbers = 7 × 7 = 49
 Som of the first 20 odd numbers = 20 × 20 = 400
5. $1 + 2 + 1 = 4$
 $1 + 2 + 3 + 2 + 1 = 9$
 $1 + 2 + 3 + 4 + 3 + 2 + 1 = 16$
 $1 + 2 + 3 + 4 + 5 + 4 + 3 + 2 + 1 = 25$
 $1 + 2 + 3 + 4 + 5 + 6 + 5 + 4 + 3 + 2 + 1 = 36$
 $1 + 2 + 3 + 4 + 5 + 6 + 7 + 6 + 5 + 4 + 3 + 2 + 1 = 49$

6. a. $45 \times 45 = 2025$ b. $55 \times 55 = 3025$
 c. $65 \times 65 = 4225$ d. $85 \times 85 = 7225$



Chapter 14 Time

EXERCISE 14 A

1. a. Midnight b. 12 Noon c. 12:40 a.m. d. 5:00 a.m.
 e. 7:30 a.m. f. 8:38 a.m. g. 12:36 p.m. h. 2:30 p.m.
 i. 4:16 p.m. j. 5:35 p.m. k. 7:45 p.m. l. 10:59 p.m.
2. a. 0430 hours b. 1010 hours c. 1125 hours d. 1200 hours
 e. 0027 hours f. 1315 hours g. 1533 hours h. 1718 hours
 i. 1856 hours j. 2100 hours k. 2245 hours l. 2359 hours

EXERCISE 14 B

1. a.
$$\begin{array}{r} \text{min} \quad \text{s} \\ 2 \quad 45 \\ + \quad 30 \\ \hline 3 \quad 15 \end{array}$$

 Sum = 3 min 15 s

b.
$$\begin{array}{r} \text{h} \quad \text{min} \\ 3 \quad 47 \\ + \quad 49 \\ \hline 4 \quad 36 \end{array}$$

 Sum = 4 h 36 min

c.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 3 \quad 27 \quad 40 \\ + \quad 34 \quad 47 \\ \hline 4 \quad 02 \quad 17 \end{array}$$

 Sum = 4 h 2 min 17 s

d.
$$\begin{array}{r} \text{h} \quad \text{min} \\ 5 \quad 18 \\ + 2 \quad 42 \\ \hline 8 \quad 00 \end{array}$$

 Sum = 8 h

e.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 3 \quad 29 \quad 25 \\ + 4 \quad 54 \quad 45 \\ \hline 8 \quad 24 \quad 10 \end{array}$$

 Sum = 8 h 25 min 10 s

f.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 4 \quad 25 \quad 52 \\ + 3 \quad 35 \quad 41 \\ \hline 8 \quad 01 \quad 33 \end{array}$$

 Sum = 8 h 1 min 33 s

2. a.
$$\begin{array}{r} \text{min} \quad \text{s} \\ \cancel{50} \quad \cancel{10} \\ - 45 \quad 40 \\ \hline 4 \quad 30 \end{array}$$

 Difference = 4 min 30 s

b.
$$\begin{array}{r} \text{h} \quad \text{min} \\ \cancel{11} \quad \cancel{29} \\ - 9 \quad 33 \\ \hline 1 \quad 56 \end{array}$$

 Difference = 1 h 56 min

c.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ \cancel{3} \quad \cancel{85} \quad \cancel{73} \\ \cancel{4} \quad \cancel{26} \quad \cancel{13} \\ - \quad 35 \quad 15 \\ \hline 3 \quad 50 \quad 58 \end{array}$$

 Difference = 3 h 50 min 58 s

d.
$$\begin{array}{r} \text{h} \quad \text{min} \\ \cancel{8} \quad \cancel{00} \\ - 4 \quad 52 \\ \hline 3 \quad 8 \end{array}$$

 Difference = 3 h 8 min

e.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ \cancel{8} \quad \cancel{95} \quad \cancel{79} \\ \cancel{9} \quad \cancel{36} \quad \cancel{19} \\ - 4 \quad 45 \quad 20 \\ \hline 4 \quad 50 \quad 59 \end{array}$$

 Difference = 4 h 50 min 59 s

f.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ \cancel{9} \quad \cancel{65} \quad \cancel{93} \\ \cancel{10} \quad \cancel{06} \quad \cancel{33} \\ - 2 \quad 20 \quad 52 \\ \hline 7 \quad 45 \quad 41 \end{array}$$

 Difference = 7 h 45 min 41 s

EXERCISE 14 C

1. a.
$$\begin{array}{r} \text{h} \quad \text{min} \\ 4 \quad 12 \\ \times \quad 3 \\ \hline 12 \quad 36 \end{array}$$

Product = 12 h 36 min

b.
$$\begin{array}{r} \text{min} \quad \text{s} \\ 3 \quad 20 \\ \times \quad 2 \\ \hline 6 \quad 40 \end{array}$$

Product = 6 min 40 s

c.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 5 \quad 15 \quad 41 \\ \times \quad \quad 4 \\ \hline 20 \quad 60 \quad 164 \end{array}$$

Product = 20h + 60m + 164s
 = 20h + 1h + (120s + 44s)
 = 21h = (2min + 44s)
 = 21 h 2min 44s

d.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 2 \quad 27 \quad 32 \\ \times \quad \quad 5 \\ \hline 10 \quad 135 \quad 160 \end{array}$$

Product = 10h + 135m + 160s
 = 10h + (120m + 15m) + (120s + 40s)
 = 10h + (2h + 15m) + (2m + 40s)
 = 10h + 2h + 15m + 2m + 40s
 = 12 h 17 min 40s

e.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 4 \quad 12 \quad 17 \\ \times \quad \quad 9 \\ \hline 36 \quad 108 \quad 153 \end{array}$$

Product = 36h + 108m + 153s
 = 36h + (60m + 48m) + (120s + 33s)
 = 36h + (1h + 48m) + (2m + 33s)
 = 36h + 1h + 48m + 2m + 33s
 = 37h 50min 33s

f.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 1 \quad 15 \quad 10 \\ \times \quad \quad 8 \\ \hline 8 \quad 120 \quad 80 \end{array}$$

Product = 8h + 120m + 80s
 = 8h + 5h + (60s + 20s)
 = 10h + (1m + 20s)
 = 10h + 1m + 20s
 = 10 h 1 min 20s

2. a.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 2 \quad 8 \quad 12 \\ 3 \overline{)6} \quad 24 \quad 36 \\ \underline{-6} \quad \quad \quad \downarrow \\ 0 \quad 24 \quad \quad \quad \downarrow \\ \quad \underline{-24} \quad \quad \quad \downarrow \\ \quad \quad 0 \quad 36 \quad \quad \quad \downarrow \\ \quad \quad \quad \underline{-3} \quad \quad \quad \downarrow \\ \quad \quad \quad \quad 6 \quad \quad \quad \downarrow \\ \quad \quad \quad \quad \underline{-6} \quad \quad \quad \downarrow \\ \quad \quad \quad \quad \quad 0 \end{array}$$

Q = 2 h 8 min 12 s

b.
$$\begin{array}{r} \text{min} \quad \text{s} \\ 10 \quad 5 \\ 4 \overline{)40} \quad 20 \\ \underline{-4} \quad \quad \quad \downarrow \\ 0 \quad 20 \quad \quad \quad \downarrow \\ \quad \underline{20} \quad \quad \quad \downarrow \\ \quad \quad 0 \end{array}$$

Q = 10 min 5 s

c.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 2 \quad 11 \quad 9 \\ 5 \overline{)10} \quad 55 \quad 45 \\ \underline{-10} \quad \quad \quad \downarrow \\ 0 \quad 55 \quad \quad \quad \downarrow \\ \quad \underline{-5} \quad \quad \quad \downarrow \\ \quad \quad 5 \quad \quad \quad \downarrow \\ \quad \quad \underline{-5} \quad \quad \quad \downarrow \\ \quad \quad \quad 0 \quad 45 \quad \quad \quad \downarrow \\ \quad \quad \quad \quad \underline{-45} \\ \quad \quad \quad \quad \quad 0 \end{array}$$

Q = 2 h 11 min 9 s

d.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 4 \quad 12 \quad 12 \\ 6 \overline{)25} \quad 13 \quad 12 \\ \underline{-24} \quad \quad \quad \downarrow \\ 1^{60\text{m}} \quad 73 \quad \quad \quad \downarrow \\ \quad \underline{-6} \quad \quad \quad \downarrow \\ \quad \quad 13 \quad \quad \quad \downarrow \\ \quad \quad \underline{-12} \quad \quad \quad \downarrow \\ \quad \quad \quad 1^{60\text{m}} \quad 72 \quad \quad \quad \downarrow \\ \quad \quad \quad \quad \underline{-6} \quad \quad \quad \downarrow \\ \quad \quad \quad \quad \quad 12 \quad \quad \quad \downarrow \\ \quad \quad \quad \quad \quad \underline{-12} \\ \quad \quad \quad \quad \quad \quad 0 \end{array}$$

Q = 4 h 12 min 12 s

e.
$$\begin{array}{r} \text{h} \quad \text{min} \quad \text{s} \\ 4 \quad 16 \quad 8 \\ 8 \overline{)34} \quad 9 \quad 4 \\ \underline{-32} \quad \quad \quad \downarrow \\ 2^{120\text{m}} \quad 129 \quad \quad \quad \downarrow \\ \quad \underline{-8} \quad \quad \quad \downarrow \\ \quad \quad 49 \quad \quad \quad \downarrow \\ \quad \quad \underline{-48} \quad \quad \quad \downarrow \\ \quad \quad \quad 1^{60\text{m}} \quad 64 \quad \quad \quad \downarrow \\ \quad \quad \quad \quad \underline{-64} \\ \quad \quad \quad \quad \quad 0 \end{array}$$

Q = 4 h 16 min 8 s

f.

	h	min	s
	3	9	18
7)	22	5	6
	-21		
	1 ^{60m}	65	
		-63	
	2 ^{120m}	126	
		-7	
		56	
		-56	
		0	

Q = 3 h 9 min 18 s

PRACTICE SHEET-3

1. a. $\frac{7}{10} = \frac{7}{10} \times 100\% = 70\%$ b. $\frac{57}{100} = \frac{57}{100} \times 100\% = 57\%$
c. $\frac{5}{16} = \frac{5}{16} \times 100\% = \frac{125}{4} = 31.25\%$ d. $\frac{3}{4} = \frac{3}{4} \times 100\% = 75\%$
e. $0.055 = \frac{55}{1000} \times 100\% = \frac{55}{10} = 5.5\%$ f. $0.9 = \frac{9}{10} \times 100 = 90\%$
g. $16 \text{ m} = \frac{16}{1000} \text{ km} = \frac{16}{1000} \times 100 = \frac{16}{10} = 1.6\%$ h. $500 \text{ g} = \frac{500}{1000} \text{ kg} = \frac{500}{1000} \times 100 = 50\%$
2. a. $1.39\% = \frac{1.39}{100} = \frac{139}{100 \times 100} = \frac{139}{10000}$ or 0.0139
b. $25\% = \frac{25}{100} = \frac{1}{4}$ or 0.25
c. $47.6\% = \frac{47.6}{100} = \frac{476}{100 \times 10} = \frac{119}{250}$ or 0.476
3. a. $80\% \text{ of } 300 \text{ m} = \frac{80}{100} \times 300 = 240 \text{ m}$ b. $30\% \text{ of } 600 \text{ g} = \frac{30}{100} \times 600 = 180 \text{ g}$
c. $22\frac{1}{2}\% \text{ of } ₹ 280 = \frac{45}{2 \times 100} \times 280 = ₹ 63$ d. $26\% \text{ of } 150 = \frac{26}{100} \times 150 = 39$
4. a. The digit to the right of the tens place in 49 is 9. And $9 > 5$
 \therefore 49 rounded off to the nearest ten is 50.
The digit to the right of the tens place in 342 is 2. And $2 < 5$
 \therefore 342 rounded off to the nearest ten is 340.
b. The digit to the right of the hundreds place in 125 is 2. And $2 > 5$
 \therefore 125 rounded off to the nearest hundred is 100.
The digit to the right of the hundreds place in 5,280 is 8. And $8 < 5$
 \therefore 5,280 rounded off to the nearest hundred is 5,300.
c. The digit to the right of the thousands place in 6,327 is 3. And $3 > 5$
 \therefore 6,327 rounded off to the nearest thousand is 6,000.
The digit to the right of the thousands place in 45,499 is 4. And $4 < 5$
 \therefore 45,499 rounded off to the nearest thousand is 45,000.

5. a. 8,45,27,000 b. 8,45,30,000 c. 8,45,00,000
 d. 8,50,00,000 e. 8,00,00,000
6. a. 4 b. 3.6
 c. 3.61 d. 3.609
7. a. 4.8 b. 4.80
8. a.

1 h	1 min	s
5	14	20
+ 3	49	50
9	04	10

Sum = 9 h 4 min 10 s

c. 4.795

b.

1 h	2 min	s
9	3	15
- 6	17	20
2	45	55

Difference = 2 h 45 min 55 s

c.

h	min	s
2	15	16
×		6
12	90	96

Product = 12 h + 90 m + 96 s
 = 12 h + (60 m + 30 m) + (60 s + 36 s)
 = 12 h + (1 h + 30 m) + (1 m + 36 s)
 = 12 h + 1 h + 30 m + 1 m + 36 s
 = 13 h 31 min 36 s

d.

h	min	s
5	12	25
5) 26	2	5
- 25	↓	↓
1 ^{60 m}	62	↓
	- 5	↓
	12	↓
	- 10	↓
	2 ^{120 m}	125
		- 10
		25
		- 25
		0

Q = 5 h 12 min 25 s

9. a. (2000) (200) (20) (2) (.2) (.02) Rule number = previous number ÷ 10
- b. (1½) (1¾) (2) (2¼) (2½) (2¾) Rule number = previous number + ¼

Chapter 15 Measurements

EXERCISE 15

1. Write in decimals.
- a. 8 mm = $8 \times \frac{1}{10}$ cm = 0.8 cm
- b. 70 cm = $70 \times \frac{1}{100}$ m = 0.7 m
- c. 95 mm = $95 \times \frac{1}{1000}$ m = 0.095 m
- d. 450 ml = $450 \times \frac{1}{1000}$ l = 0.45 l
- e. 37 g = $37 \times \frac{1}{1000}$ kg = 0.037 kg

- f. $7 \text{ ml} = 7 \times \frac{1}{1000} \text{ l} = 0.007 \text{ l}$
 g. $303 \text{ m} = 303 \times \frac{1}{1000} \text{ km} = 0.303 \text{ km}$
 h. $60 \text{ m} = 60 \times \frac{1}{1000} \text{ km} = 0.06 \text{ km}$
 i. $4.8 \text{ g} = 4.8 \times \frac{1}{1000} \text{ kg} = 0.0048 \text{ kg}$

2. Fill in the blanks.

- a. $2.5 \text{ mm} = 2.5 \times \frac{1}{10} \text{ cm} = 0.25 \text{ cm}$
 b. $4.7 \text{ cm} = 4.7 \times \frac{1}{100} \text{ m} = 0.047 \text{ m}$
 c. $865 \text{ cm} = 865 \times \frac{1}{100} \text{ m} = 8.65 \text{ m}$
 d. $78.5 \text{ g} = 78.5 \times \frac{1}{1000} \text{ kg} = 0.0785 \text{ kg}$
 e. $6.7 \text{ ml} = 6.7 \times \frac{1}{1000} \text{ l} = 0.0067 \text{ l}$
 f. $9.5 \text{ m} = 9.5 \times 1000 \text{ mm} = 9500 \text{ mm}$
 g. $3.07 \text{ m} = 3.07 \times 100 \text{ cm} = 307 \text{ cm}$
 h. $8.09 \text{ l} = 8.09 \times 1000 \text{ ml} = 8090 \text{ ml}$
 i. $65.4 \text{ kg} = 65.4 \times 1000 \text{ g} = 65400 \text{ g}$
 j. $11.8 \text{ km} = 11.8 \times 1000 \text{ m} = 11800 \text{ m}$
 k. $70 \text{ m} = 70 \times \frac{1}{1000} \text{ km} = 0.07 \text{ km}$
 l. $4321 \text{ g} = 4321 \times \frac{1}{1000} \text{ kg} = 4.321 \text{ kg}$

3. Convert.




- a. $319 \text{ cm} = 319 \times \frac{1}{100} \text{ m} = 3.19 \text{ m}$
 b. $8.3 \text{ m} = 8.3 \times 100 \text{ cm} = 830 \text{ cm}$
 c. $9.5 \text{ m} = 9.5 \times 1000 \text{ mm} = 9500 \text{ mm}$
 d. $18.7 \text{ cm} = 18.7 \times \frac{1}{100} \text{ m} = 0.187 \text{ m}$
 e. $75 \text{ mm} = 75 \times \frac{1}{10} \text{ cm} = 7.5 \text{ cm}$
 f. $3570 \text{ ml} = 3570 \times \frac{1}{1000} \text{ l} = 3.57 \text{ l}$
 g. $40.5 \text{ ml} = 40.5 \times \frac{1}{1000} \text{ l} = 0.0405 \text{ l}$


- h. $20.39 \text{ kg} = 20.39 \times 1000 \text{ g} = 20390 \text{ g}$
 i. $1234 \text{ g} = 1234 \times \frac{1}{1000} \text{ kg} = 1.234 \text{ kg}$
 j. $42.85 \text{ kg} = 42.85 \times 1000 \text{ g} = 42850 \text{ g}$
 k. $74 \text{ m} = 74 \times \frac{1}{1000} \text{ km} = 0.074 \text{ km}$
 l. $35.05 \text{ km} = 35.05 \times 1000 \text{ m} = 35050 \text{ m}$


Chapter 16 Lines, Angles and Shapes


EXERCISE 16A

1. Look at the figures and fill in the blanks.

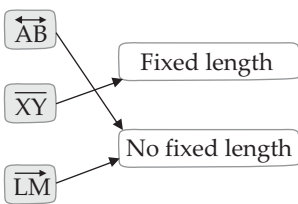
- a.  AB is a straight line.
- b.  PQ is a line segment.
- c.  RS is a ray.

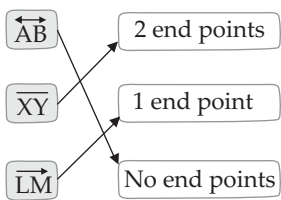
d. 
 Number of line segments = 7

e. 
 Number of line segments = 10

f. 
 Number of line segments = 6

2. Match these.

a. 

b. 

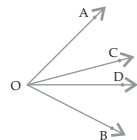
EXERCISE 16B

1. Look at the figure and fill in the blanks.

- a. $\angle ABC$ b. \vec{BA}, \vec{BC} c. B

2. Write '<' or '>'.

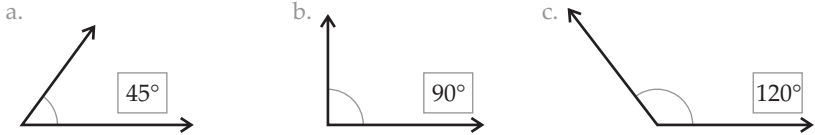
- a. $\angle DOC$ < $\angle BOC$ b. $\angle AOC$ > $\angle COD$
 c. $\angle COB$ < $\angle AOB$ d. $\angle AOD$ > $\angle AOC$



3. Write the name (acute, obtuse, etc.) of the angle.

- a. 30° b. 360° c. 100°
 d. 90° e. 120° f. 45°
 g. 180° h. 70° i. 110°

4. Use a protractor to measure these angles.



5. Use a protractor to draw these angles in your notebook.

Do yourself.

6. Write 'true' or 'false'.

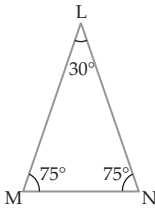
- a. false b. false c. true d. false e. true

EXERCISE 16 C

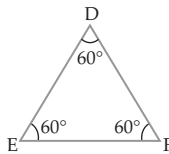
1. Look at the figure and fill in the blanks.

- a. $\angle DEF$, $\angle EFD$ and $\angle FDE$ b. D, E and F c. DE, EF and FD d. $\triangle DEF$

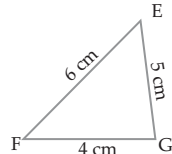
2. Write 'scalene \triangle ', 'equilateral \triangle ' or 'isosceles \triangle '.



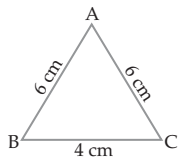
a.



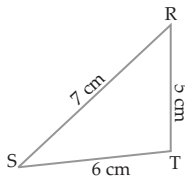
b.



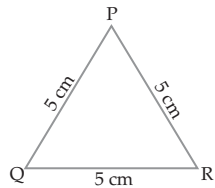
c.



d.

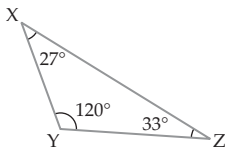


e.

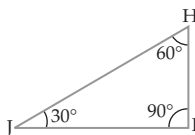


f.

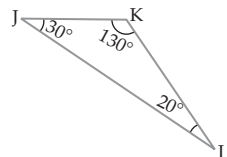
3. Write 'acute-angled \triangle ', 'obtuse-angled \triangle ' or 'right-angled \triangle '.



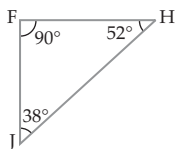
a.



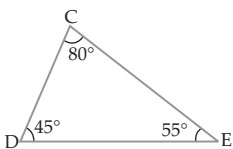
b.



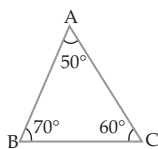
c.



d.



e.



f.

EXERCISE 16 D

1. Tick the quadrilaterals.



a.



b.



c.



d.

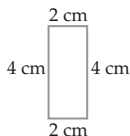


e.

2. Look at the figure and fill in the blanks.

- a. quadrilateral b. BD and AC c. AB, BC, CD and DA d. A, B, C and D.
 e. $\triangle ABD, \triangle CBD, \triangle ADC, \triangle ABC, \triangle OAB, \triangle OBC, \triangle OCD$ and $\triangle ODA$.

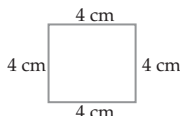
3. Each angle of the given quadrilaterals is a right angle. Pick the rectangles and squares.



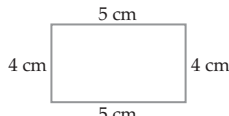
a.



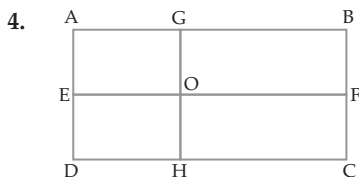
b.



c.



d.



All the angles in the figures = 90° .

a. Name the rectangles.

ABCD, AEFB, CDEF, ADHG,
BCHG, AEOG, EOHD, BFOG and
CFOH.

b. Count them: 9

MENTAL MATHS

- $45^\circ, 45^\circ$
- Do yourself

Chapter 17 Perimeter and Area

EXERCISE 17A

1. Find the perimeter.

a. Perimetre = $7.2 \text{ cm} + 6.5 \text{ cm} + 4.9 \text{ cm} = 18.6 \text{ cm}$

b. Perimetre = $3.5 \text{ cm} + 2.2 \text{ cm} + 4.5 \text{ cm} + 3.8 \text{ cm} + 2.5 \text{ cm} + 4 \text{ cm} = 20.5 \text{ cm}$

c. Perimetre = 2 cm + 6 cm + 6 cm + 5.5 cm = 19.5 cm

2. Find the perimeter of a rectangle of:

a. L = 4.2 cm, B = 2.7 cm

$$\begin{aligned} P &= 2 \times (L + B) \\ &= 2 \times (4.2 + 2.7) \\ &= 2 \times 6.9 \\ &= 13.8 \text{ cm} \end{aligned}$$

b. L = 11.25 cm, B = 7.5 cm

$$\begin{aligned} P &= 2 \times (L + B) \\ &= 2 \times (11.25 + 7.5) \\ &= 2 \times 18.75 \\ &= 37.5 \text{ cm} \end{aligned}$$

c. L = 25.5 m, B = 17.5 m

$$\begin{aligned} P &= 2 \times (L + B) \\ &= 2 \times (25.5 + 17.5) \\ &= 2 \times 43 \\ &= 86 \text{ m} \end{aligned}$$

3. Find the perimeter of a square of side:

a. S = 75 m

$$\begin{aligned} P &= 4 \times s \\ &= 4 \times 75 \text{ m} \\ &= 300 \text{ m} \end{aligned}$$

b. S = 11.5 cm

$$\begin{aligned} P &= 4 \times s \\ &= 4 \times 11.5 \text{ cm} \\ &= 46 \text{ cm} \end{aligned}$$

c. S = 62.5 m

$$\begin{aligned} P &= 4 \times s \\ &= 4 \times 62.5 \text{ m} \\ &= 250 \text{ m} \end{aligned}$$

d. S = 27.8 cm

$$\begin{aligned} P &= 4 \times s \\ &= 4 \times 27.8 \text{ cm} \\ &= 111.2 \text{ cm} \end{aligned}$$

e. S = 6.4 cm

$$\begin{aligned} P &= 4 \times s \\ &= 4 \times 6.4 \text{ cm} \\ &= 25.6 \text{ cm} \end{aligned}$$

4. Find the side of a square, if:

a. P = 40 cm

$$\begin{aligned} \text{Side of square} &= \frac{P}{4} \\ &= \frac{40}{4} \text{ cm} \\ &= 10 \text{ cm} \end{aligned}$$

b. P = 73.6 m

$$\begin{aligned} S &= \frac{P}{4} \\ &= \frac{73.6}{4} \text{ m} \\ &= 18.4 \text{ m} \end{aligned}$$

c. P = 56 m

$$\begin{aligned} S &= \frac{P}{4} \\ &= \frac{56}{4} \text{ cm} \\ &= 14 \text{ cm} \end{aligned}$$

d. P = 84 m

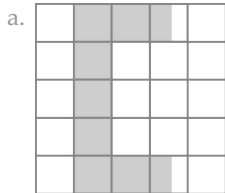
$$\begin{aligned} S &= \frac{P}{4} \\ &= \frac{84}{4} \text{ m} \\ &= 21 \text{ m} \end{aligned}$$

e. P = 96.8 m

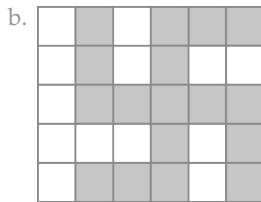
$$\begin{aligned} S &= \frac{P}{4} \\ &= \frac{96.8}{4} \text{ m} \\ &= 24.2 \text{ m} \end{aligned}$$

EXERCISE 17 B

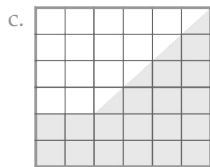
1.



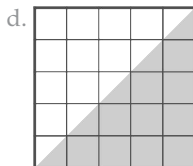
Area = 8 sq. cm



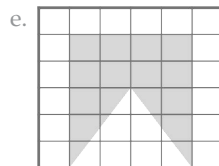
Area = 17 sq. cm



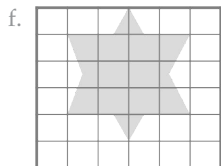
Area = 20 sq. cm



Area = 12.5 sq. cm



Area = 14 sq. cm



Area = 10 sq. cm

2. Find the area of each rectangle from its length (L) and breadth (B).

a. $L = 3.7 \text{ m}, B = 2 \text{ m}$

$$A = L \times B$$

$$= 3.7 \text{ m} \times 2 \text{ m}$$

$$= 7.4 \text{ sq m}$$

b. $L = 15 \text{ km}, B = 7 \text{ km}$

$$A = L \times B$$

$$= 15 \text{ km} \times 7 \text{ km}$$

$$= 105 \text{ sq km}$$

c. $L = 20.5 \text{ cm}, B = 13 \text{ cm}$

$$A = L \times B$$

$$= 20.5 \text{ cm} \times 13 \text{ cm}$$

$$= 266.5 \text{ sq cm}$$

b. $L = 17 \text{ m}, B = 12 \text{ m}$

$$A = L \times B$$

$$= 17 \text{ m} \times 12 \text{ m}$$

$$= 204 \text{ sq m}$$

3. Find the length of each rectangle from its Area (A) and breadth (B).

a. $A = 275 \text{ sq m}, B = 10 \text{ m}$

$$L = \frac{A}{B}$$

$$= \frac{275}{10} \text{ Sq m}$$

$$= 27.5 \text{ m}$$

b. $A = 378 \text{ sq m}, B = 15 \text{ m}$

$$L = \frac{A}{B}$$

$$= \frac{378}{15} \text{ Sq m}$$

$$= 25.2 \text{ m}$$

c. $A = 306 \text{ sq m}, B = 12 \text{ km}$

$$L = \frac{A}{B}$$

$$= \frac{306}{12} \text{ Sq m}$$

$$= 25.5 \text{ m}$$

d. $A = 380 \text{ sq m}, B = 19 \text{ m}$

$$L = \frac{A}{B}$$

$$= \frac{380}{19} \text{ Sq m}$$

$$= 20 \text{ m}$$

4. Find the breadth of each rectangle from its Area (A) and length (L).

a. $A = 8000 \text{ sq m}$

$$L = 160 \text{ m}$$

$$B = \frac{A}{L}$$

$$= \frac{8000}{160} \text{ Sq m}$$

$$= 50 \text{ m}$$

b. $A = 1500 \text{ sq km}$

$$L = 200 \text{ km}$$

$$B = \frac{A}{L}$$

$$= \frac{1500}{200} \text{ Sq km}$$

$$= 7.5 \text{ km}$$

c. $A = 645 \text{ sq cm}$

$$L = 43 \text{ cm}$$

$$B = \frac{A}{L}$$

$$= \frac{645}{43} \text{ Sq cm}$$

$$= 15 \text{ cm}$$

5. Find the area of a square of side:

a. Side of square = 12 cm

$$\text{The area of square} = \text{side} \times \text{side}$$

$$= 12 \text{ cm} \times 12 \text{ cm}$$

$$= 144 \text{ sq cm}$$

b. Side of square = 15 cm

$$\text{The area of square} = \text{side} \times \text{side}$$

$$= 15 \text{ m} \times 15 \text{ m}$$

$$= 225 \text{ sq m.}$$

- c. Side of square = 19 cm
 The area of square = side \times side
 $= 19 \text{ km} \times 19 \text{ km}$
 $= 361 \text{ sq km}$
- d. Side of square = 25 cm
 The area of square = side \times side
 $= 25 \text{ cm} \times 25 \text{ cm}$
 $= 625 \text{ sq cm}$
- e. Side of square = 33 cm
 The area of square = side \times side
 $= 33 \text{ m} \times 33 \text{ m}$
 $= 1089 \text{ sq m.}$

EXERCISE 17 C

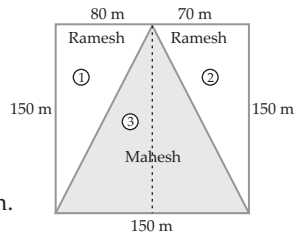
1. Sides of the triangular field = 100 m, 80 m and 60 m.
 Perimeter = side + side + side
 $= 100 \text{ m} + 80 \text{ m} + 60 \text{ m} = 240 \text{ m}$
 \therefore Wire required for one time fencing = 240 m
 Wire required for 3 time fencing = $3 \times 240 \text{ m} = 720 \text{ m}$
 cost of 1 metre wire = ₹ 50
 \therefore cost of 720 metre wire = ₹ $720 \times 50 = ₹ 36000$
 So, length of required wire is 720 m and the cost is ₹ 36000.

2. Length of chart = 60 cm
 Breadth of chart = 50 cm
 Border of all around = 4 cm
 \therefore Left length = $60 - (4 + 4) = 60 - 8 = 52 \text{ cm}$
 Left breadth = $50 - (4 + 4) = 50 - 8 = 42 \text{ cm}$
 \therefore Area of left space = $52 \text{ cm} \times 42 \text{ cm}$
 $= 2184 \text{ sq cm.}$
 So, 2184 sq cm space was left for sticking the picture.

3. Area of triangle 1 = $\frac{1}{2} \times 80 \times 150 = 6000 \text{ sq m}$
 Area of triangle 2 = $\frac{1}{2} \times 70 \times 150 = 5250 \text{ sq m}$
 Ramesh got total land = $6000 \text{ sq m} + 5250 \text{ sq m}$
 $= 11250 \text{ sq m.}$

Now, Area of triangle 3 = $\frac{1}{2} \times 150 \times 150 = 11250 \text{ sq m.}$

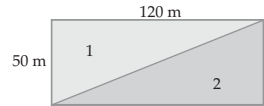
\therefore Mahesh got land = 11250 sq m
 So, Each got 11250 sq m land.



4. Area of triangle 1 = $\frac{1}{2} \times 120 \text{ m} \times 50 \text{ m}$
 = 3000 sq m

\therefore In rectangle opposite sides are same
 \therefore Area of both triangles are same

So, the area of each plot is 3000 sq m and both are same size.



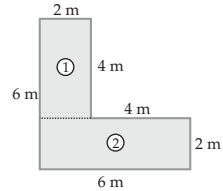
5. Area of balcony = Area of rectangle 1 + Area of rectangle 2
 = $(4 \text{ m} \times 2 \text{ m}) + (6 \text{ m} \times 2 \text{ m})$
 = 8 sq m + 12 sq m = 20 sq m.
 = $20 \times 10,000 \text{ sq cm} = 2,00,000 \text{ sq cm}$

Length of tile = 20 cm and breadth of tile = 10 cm

Area of one tile = 20 cm \times 10 cm = 200 sq cm

Required number of tiles = $\frac{\text{Area of balcony}}{\text{Area of one tile}} = \frac{200000}{200} = 1000$

So, the area of balcony is 20 sq m and number of required tiles are 1000.

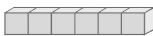


Chapter 18 Volume

EXERCISE 18

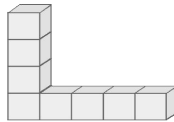
1. Find the volume of each cuboid by counting the unit cubes of volume 1 cu cm.

a.



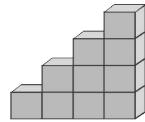
Volume = 6 cu cm

b.



Volume = 8 cu cm

c.



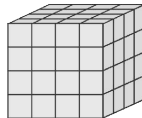
Volume = 10 cu cm

d.



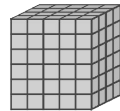
Volume = 24 cu cm

e.



Volume = $4 \times 4 \times 4 = 64$ cu cm

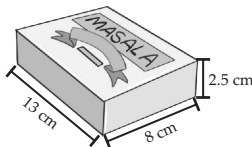
f.



Volume = $6 \times 5 \times 4 = 120$ cu cm

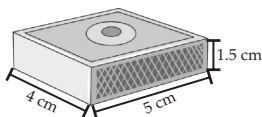
2. Find the volume of each.

a.



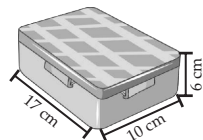
Volume = 13 cm \times 8 cm
 \times 2.5 cm
 = 260 cu cm

b.



Volume = 4 cm \times 5 cm
 \times 1.5 cm
 = 30 cu cm

c.



Volume = 17 cm \times 10 cm
 \times 6 cm
 = 1020 cu cm

3. Match the volume (V) of each cube with its edge (E).

	a.	b.	c.	d.	e.
V	729 cu cm	125 cu cm	343 cu cm	3375 cu m	1728 cu m
E	5 cm	9 cm	12 m	7 cm	15 m

4. Fill in the volume for each cuboid (L=length, B=breath, H=height, V=volume).

a. $L = 6 \text{ m}, B = 4 \text{ m}, H = 3.5 \text{ m}$

$$V = L \times B \times H$$

$$= 6 \text{ m} \times 4 \text{ m} \times 3.5 \text{ m}$$

$$= 84 \text{ cu m}$$

b. $L = 10.5 \text{ m}, B = 6 \text{ m}, H = 5 \text{ m}$

$$V = L \times B \times H$$

$$= 10.5 \text{ m} \times 6 \text{ m} \times 5 \text{ m}$$

$$= 315 \text{ cu m}$$

c. $L = 35 \text{ cm}, B = 20 \text{ cm}, H = 12.5 \text{ cm}$

$$V = L \times B \times H$$

$$= 35 \text{ cm} \times 20 \text{ cm} \times 12.5 \text{ cm}$$

$$= 8,750 \text{ cu cm}$$

d. $L = 50 \text{ cm}, B = 30 \text{ cm}, H = 25 \text{ cm}$

$$V = L \times B \times H$$

$$= 50 \text{ cm} \times 30 \text{ cm} \times 25 \text{ cm}$$

$$= 37,500 \text{ cu cm}$$

e. $L = 40 \text{ cm}, B = 26.5 \text{ cm}, H = 12 \text{ cm}$

$$V = L \times B \times H$$

$$= 40 \text{ cm} \times 26.5 \text{ cm} \times 12 \text{ cm}$$

$$= 12,720 \text{ cu cm}$$

5. Length of swimming pool = 25 m

Breadth of swimming pool = 15 m

Depth of swimming pool = 10 m

Volume of swimming pool = Length \times Breadth \times Depth

$$= 25 \text{ m} \times 15 \text{ m} \times 10 \text{ m}$$

$$= 3750 \text{ cu m}$$

Quantity of water = $\frac{1}{3}$ of pool volume

$$= \frac{1}{3} \times 3750 = 1250 \text{ cu m}$$

So, the volume of swimming pool is 3750 cu m and volume of water is 1250 cu m.

6. Dimension of container = 20 cm \times 15 cm \times 10 cm

Volume of container = 20 cm \times 15 cm \times 10 cm

$$= 3000 \text{ cu cm} = \frac{3000}{1000} = 3 \text{ l}$$

Water in container = 1.69 l

Required water = 3 l - 1.69 l

$$= 1.31 \text{ l}$$

So, 1.31 l of water is needed to fill the container completely.

7. Length of wall = 10 m = 10×100 cm = 1000 cm
 Breadth of wall = 1 m = 1×100 cm = 100 cm
 Height of wall = 4 m = 4×100 cm = 400 cm
 Volume of wall = $L \times B \times H = 1000$ cm \times 100 cm \times 400 cm
 Length of brick = 20 cm
 Breadth of brick = 10 cm
 Height of brick = 10 cm
 Volume of brick = 20 cm \times 10 cm \times 10 cm

$$\text{Number of bricks required} = \frac{1000 \text{ cm} \times 100 \text{ cm} \times 400 \text{ cm}}{20 \text{ cm} \times 10 \text{ cm} \times 10 \text{ cm}} = 50 \times 400 = 20,000$$

So, 20,000 bricks required.

8. Volume of box = 10 cm \times 10 cm \times 10 cm = 1000 cu cm
 Volume of 1 eraser = 2 cm \times 1 cm \times 1 cm = 2 cu cm

$$\text{Number of erasers can be packed in a box} = \frac{1000 \text{ cu cm}}{2 \text{ cu cm}} = 500$$

So, 500 erasers can be packed in a cardboard box.

9. Volume of box = 1176 cu cm
 Length of box = 12 cm
 Width of box = 7 cm

$$\text{Height of box} = \frac{\text{Volume}}{\text{Length} \times \text{Width}} = \frac{1176}{12 \times 7} = 14 \text{ cm}$$

So, height of box is 14 cm.

10. Base area = Length \times Breadth = 125 sq cm
 Height of book = 25 cm

$$\begin{aligned} \therefore \text{Volume of book} &= \text{Length} \times \text{Breadth} \times \text{Height} \\ &= 125 \text{ sq cm} \times 25 \text{ cm} \quad (\text{Length} \times \text{Breadth} = 125 \text{ sq cm}) \\ &= 3125 \text{ cu cm} \end{aligned}$$

So, the volume of book is 3125 cu cm.

Chapter 19 Data Handling

EXERCISE 19

1. Ascending order : 15, 16, 16, 17, 17, 17, 17, 18, 18, 18, 18, 18, 18, 18, 18, 18, 19, 19, 20

Scores	15	16	17	18	19	20
Number of times	1	2	4	6	2	1

- a. 18
 b. 15 or 20
 c. Yes

2.

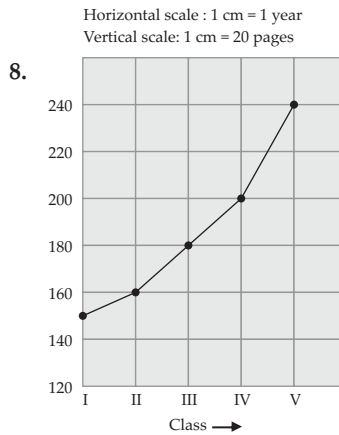
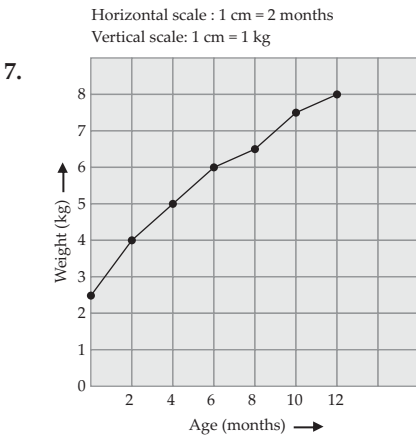
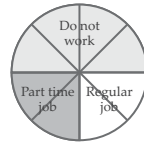
Number of absent students	Tally marks	Number of days
1	##	5
2	##	5
3	##	5
4		3
5		3

3.

Activity		Number
Art and craft	⊕ ⊕ ⊕ ⊕ ⊕	40
Music	⊕ ⊕ ⊕	24
Drawing	⊕ ⊕ ⊕ ⊕ ◐	36
Acting	⊕ ⊕ ⊕ ⊕ ⊕ ◐	50

4. a. $65 - 50 = 15$ b. $55 - 35 = 20$
 c. Sanjay Memorial School d. $50 + 55 + 35 = 140$
5. a. 8, 12 b. $18 - 12 = 6$ c. $22 - 8 = 14$ d. City A

6. a. $\frac{20}{40} = \frac{1}{2}$ b. $\frac{10}{40} = \frac{1}{4}$ c. $\frac{10}{40} = \frac{1}{4}$



EXERCISE 20

1.	S.No.	Item	Quantity	Rate	Amount
	1.	Notebook	5	₹ 12	₹ 60
	2.	Pen	2	₹ 10	₹ 20
	3.	Pencil	4	₹ 3	₹ 12
	4.	Eraser	2	₹ 2	₹ 4
Total					₹ 96

2. Time = 5 hours, Distance = 230 km

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{230 \text{ km}}{5 \text{ h}} = 46 \text{ km/h}$$

So, speed of train is 46 km/h.

3. Distance = 156 km, Time = 3 hours

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{156 \text{ km}}{3 \text{ h}} = 52 \text{ km/h}$$

So, speed of car is 52 km/h.

4. Speed = 45 km/h, Time = 5 hours

$$\text{Distance} = \text{Speed} \times \text{Time} = 45 \text{ km/h} \times 5 \text{ h} = 225 \text{ km}$$

So, the truck covers 225 km.

5. Speed = 25 km/h, Distance = 225 km

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{225 \text{ km}}{25 \text{ km/h}} = 9 \text{ h}$$

So, the ship takes 9 hours.

6. Speed = 55 km/h, Time = 30 minutes = $\frac{30}{60}$ hour = $\frac{1}{2}$ h

$$\text{Distance} = \text{Speed} \times \text{Time} = 55 \text{ km/h} \times \frac{1}{2} \text{ h} = \frac{55}{2} \text{ km} = 27.5 \text{ km}$$

So, his friend's house is 27.5 km far.

PRACTICE SHEET-4

1. Fill in the blanks.

a. one b. \overline{AB} c. acute d. obtuse e. equilateral f. scalene

2. Write 'true' or 'false'.

a. False b. False c. False d. True e. True

3. Find the perimeter and area of a rectangle of:

a. L = 21 cm, B = 13.7 cm

$$\text{Perimeter} = 2 \times (L + B)$$

$$= 2 \times (21 \text{ cm} + 13.7 \text{ cm})$$

$$= 2 \times 34.7 \text{ cm}$$

$$= 69.4 \text{ cm}$$

$$\text{Area} = L \times B$$

$$= 21 \text{ cm} \times 13.7 \text{ cm}$$

$$= 287.7 \text{ sq cm}$$

b. $L = 16.5 \text{ cm}, B = 12 \text{ cm}$

$$\begin{aligned}\text{Perimeter} &= 2 \times (L + B) \\ &= 2 \times (16.5 \text{ cm} + 12 \text{ cm}) \\ &= 2 \times 28.5 \text{ cm} \\ &= 57 \text{ cm}\end{aligned}$$

$$\begin{aligned}\text{Area} &= L \times B \\ &= 16.5 \text{ cm} \times 12 \text{ cm} \\ &= 198 \text{ sq cm}\end{aligned}$$

c. $L = 14.5 \text{ km}, B = 7 \text{ km}$

$$\begin{aligned}\text{Perimeter} &= 2 \times (L + B) \\ &= 2 \times (14.5 \text{ km} + 7 \text{ km}) \\ &= 2 \times 21.5 \text{ km} \\ &= 43 \text{ km}\end{aligned}$$

$$\begin{aligned}\text{Area} &= L \times B \\ &= 14.5 \text{ km} \times 7 \text{ km} \\ &= 101.5 \text{ sq km}\end{aligned}$$

4. Find the perimeter and area of a square of side :

a. Side = 11 cm

$$\begin{aligned}\text{Perimeter} &= 4 \times \text{side} \\ &= 4 \times 11 \text{ cm} \\ &= 44 \text{ cm} \\ \text{Area} &= \text{side} \times \text{side} \\ &= 11 \text{ cm} \times 11 \text{ cm} \\ &= 121 \text{ sq cm}\end{aligned}$$

b. Side = 7 cm

$$\begin{aligned}\text{Perimeter} &= 4 \times \text{side} \\ &= 4 \times 7 \text{ cm} \\ &= 28 \text{ cm} \\ \text{Area} &= \text{side} \times \text{side} \\ &= 7 \text{ cm} \times 7 \text{ cm} \\ &= 49 \text{ sq cm}\end{aligned}$$

c. Side = 19 m

$$\begin{aligned}\text{Perimeter} &= 4 \times \text{side} \\ &= 4 \times 19 \text{ m} \\ &= 76 \text{ m} \\ \text{Area} &= \text{side} \times \text{side} \\ &= 19 \text{ m} \times 19 \text{ m} \\ &= 361 \text{ sq m}\end{aligned}$$

d. Side = 26 m

$$\begin{aligned}\text{Perimeter} &= 4 \times \text{side} \\ &= 4 \times 26 \text{ m} \\ &= 104 \text{ m} \\ \text{Area} &= \text{side} \times \text{side} \\ &= 26 \text{ m} \times 26 \text{ m} \\ &= 676 \text{ sq m}\end{aligned}$$

e. Side = 13 km

$$\begin{aligned}\text{Perimeter} &= 4 \times \text{side} \\ &= 4 \times 13 \text{ km} \\ &= 52 \text{ km} \\ \text{Area} &= \text{side} \times \text{side} \\ &= 13 \text{ km} \times 13 \text{ km} \\ &= 169 \text{ sq km}\end{aligned}$$

5. Find the volume of:

a. $L = 30 \text{ cm}, B = 25 \text{ cm}, H = 10.5 \text{ cm}$

$$\begin{aligned}\text{Volume} &= L \times B \times H \\ &= 30 \text{ cm} \times 25 \text{ cm} \times 10.5 \text{ cm} \\ &= 7875 \text{ cu cm}\end{aligned}$$

b. cube edge = 11 cm

$$\begin{aligned}\text{Volume} &= \text{edge} \times \text{edge} \times \text{edge} \\ &= 11 \text{ cm} \times 11 \text{ cm} \times 11 \text{ cm} \\ &= 1331 \text{ cu cm}\end{aligned}$$

c. $L=5\text{ m}, B=4.5\text{ m}, H=2\text{ m}$
 $\text{Volume} = L \times B \times H$
 $= 5\text{ m} \times 4.5\text{ m} \times 2\text{ m}$
 $= 45\text{ cu m}$

d. $\text{cube edge} = 6\text{ m}$
 $\text{Volume} = \text{edge} \times \text{edge} \times \text{edge}$
 $= 6\text{ m} \times 6\text{ m} \times 6\text{ m}$
 $= 216\text{ cu m}$

6. a. $\text{Distance} = 260\text{ km}, \text{Time} = 4\text{ h}$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{250\text{ km}}{4\text{ h}} = 65\text{ km/h}$$

So, speed of train is 65 km/h.

b. $\text{Speed} = 75\text{ km/h}, \text{Time} = 5\text{ h}$

$$\text{Distance} = \text{Speed} \times \text{Time} = 75\text{ km/h} \times 5\text{ h} = 375\text{ km}$$

So, the car travels 375 km.

c. $\text{Speed} = 28\text{ km/h}, \text{Distance} = 196\text{ km}$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{196\text{ km}}{28\text{ km/h}} = 7\text{ h}$$

So, boat take 7 h.

7.

S.No.	Item	Quantity	Rate	Amount
1.	Cooking oil	5 l	₹ 108/l	₹ 540
2.	Jeera	250 g	₹ 240/kg	₹ 60
3.	Dal	500 g	₹ 80/kg	₹ 40
4.	Atta	5 kg	₹ 22/kg	₹ 110
Total				₹ 750