



# Accurate Mathematics

A Course Book in Mathematics with Activity

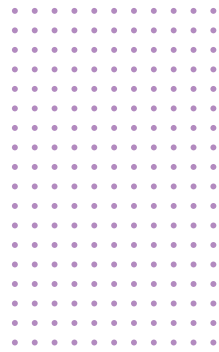
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# Accurate Mathematics

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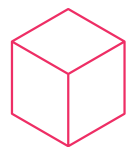
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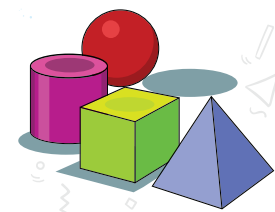
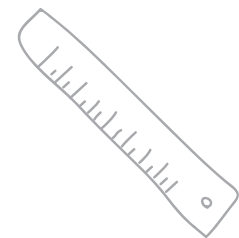
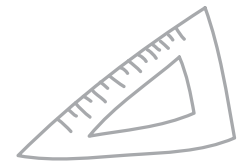
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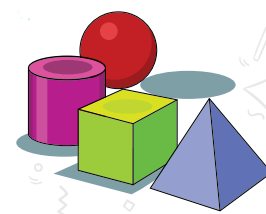
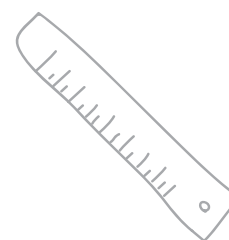
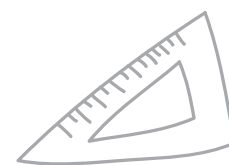
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# 1. Review



## Exercise 1A

1. Write using Roman numerals.

5	7	9	10	12	27	36	43	48	50

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:

a. \_\_\_\_\_ 20,000

b. \_\_\_\_\_ 1,09,000

c. \_\_\_\_\_ 62,000

d. \_\_\_\_\_ 75,500

e. \_\_\_\_\_ 4,85,000

4. Write the place value of the given digits.

a. 36,794    3 \_\_\_\_\_    7 \_\_\_\_\_    6 \_\_\_\_\_

b. 23,481    2 \_\_\_\_\_    3 \_\_\_\_\_    4 \_\_\_\_\_

c. 6,43,287    6 \_\_\_\_\_    8 \_\_\_\_\_    3 \_\_\_\_\_

d. 8,23,694    8 \_\_\_\_\_    2 \_\_\_\_\_    6 \_\_\_\_\_

e. 25,67,489    2 \_\_\_\_\_    5 \_\_\_\_\_    6 \_\_\_\_\_

5. Do these sums.

a. 
$$\begin{array}{r} 687543 \\ + 214198 \\ \hline \end{array}$$

b. 
$$\begin{array}{r} 578213 \\ + 234875 \\ \hline \end{array}$$

c. 
$$\begin{array}{r} 481235 \\ - 176238 \\ \hline \end{array}$$

d. 
$$\begin{array}{r} 802304 \\ - 368476 \\ \hline \end{array}$$

e.  $32480 + 43596 + 625016 + 38401$

f.  $523345 - 153442 + 67389 - 34281$

6. Fill in the missing digits.

a. 
$$\begin{array}{r} 2\ \square\ 4\ \square\ 6 \\ + 1\ 3\ \square\ 5\ \square \\ \hline 3\ 6\ 9\ 0\ 8 \end{array}$$

b. 
$$\begin{array}{r} 6\ 7\ \square\ 2\ \square \\ - 2\ \square\ 3\ \square\ 3 \\ \hline \square\ 2\ 8\ 0\ 7 \end{array}$$

c. 
$$\begin{array}{r} 3\ \square\ 0\ \square\ 2\ 3 \\ - 2\ 3\ 4\ 4\ \square\ 4 \\ \hline \square\ 2\ \square\ 4\ 7\ \square \end{array}$$

d. 
$$\begin{array}{r} \square\ 5\ \square\ 7\ 8\ \square \\ + 3\ \square\ 3\ \square\ 3\ 6 \\ \hline 8\ 4\ 6\ 5\ \square\ 9 \end{array}$$

Fill in.

7. a.  $43 \times 0 =$

b.  $85 \times 100 =$

c.  $315 \times 40 =$

d.  $12 \times 3000 =$

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

9. a.  $4 \times 15 = 60$ , so 60 is a \_\_\_\_\_ of 4 and 15.  
b. 18 and 4 are factors of 72. So 72 is \_\_\_\_\_ by 18 and 4.  
c.  $3 \times 5 \times 2 = 30$ , so 2, 3, 5, 6, 10 and 15 are \_\_\_\_\_ of 30.  
d. Among 18, 29, 85, 563, 900 and 32 324, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_ are even numbers.  
e. Among 22, 36, 45, 338, 4 831 and 11 780, \_\_\_\_\_ and \_\_\_\_\_ are odd numbers.  
f. Among 13, 23, 33 and 63, the prime numbers are \_\_\_\_\_ and \_\_\_\_\_.  
g. Among 34, 37, 39 and 47, the composite numbers are \_\_\_\_\_ and \_\_\_\_\_.  
h. The second and third multiples of 18 are \_\_\_\_\_ and \_\_\_\_\_ respectively.  
i. Three factors of 28 other than 1 and 28 are \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.  
j. To make 253 divisible by 5, the smallest number that needs to be added to it is \_\_\_\_\_.

10. **Multiply:** a.  $45 \times 12$       b.  $39 \times 18$       c.  $163 \times 23$       d.  $428 \times 34$       e.  $5482 \times 521$

11. **Divide:** a.  $562 \div 14$       b.  $378 \div 27$       c.  $5508 \div 54$       d.  $44044 \div 143$       e.  $47625 \div 340$

12. **Simplify:** a.  $640 \div 80 \times 4 - 4$  of  $20 + 639 - 72 \div 9$       b.  $29 \times 5 - 12 \times 7 - 13 \times 5 + 82 \times 8$

13. **Write the first two common multiples of:** a. 3 and 4      b. 2 and 5

14. Test 341, 94, 960 and 1281 for divisibility by 2, 3, 5 and 10.

15. a. Find all the numbers between 283 and 297 that are divisible by both 2 and 3.  
b. Find the greatest 4-digit number that is divisible by 5.

16. **Find the prime factors by repeated division:** a. 66      b. 256

17. a. Which number is 14,267 more than 31,725?  
b. By how much is 2,05,074 greater than the sum of 74,272 and 85,106?  
c. A building has 18 floors. Each floor has 6 flats. Each flat has 5 rooms. How many rooms are there in the building?  
d. The product of two numbers is 47,040. If one of them is 480, find the other.  
e. Find the number which when divided by 12 gives 97 as quotient and 8 as remainder.  
f. Find the smallest 5-digit number that is divisible by 35.  
g. Vipin wants a LED TV that costs ₹ 31,200. He can take it home by paying ₹ 6,000 and pay the rest in 12 equal monthly payments. How much will he have to pay each month?



## Exercise 1B

### 1. Fill in.

- a.  $\frac{1}{6}$  of 24 = \_\_\_\_\_,  $\frac{3}{5}$  of 75 = \_\_\_\_\_,  $\frac{5}{12}$  of 72 = \_\_\_\_\_.
- b.  $\frac{12}{7}$  is a / an \_\_\_\_\_ fraction and  $5\frac{2}{3}$  is a / an \_\_\_\_\_ fraction.
- c. In  $7\frac{3}{8}$ , the intergral part is \_\_\_\_\_ and the fractional part is \_\_\_\_\_.
- d. Among  $\frac{2}{5}, \frac{5}{11}, \frac{7}{11}, \frac{3}{8}, \frac{6}{13}$  and  $\frac{9}{11}$  the like fractions are: \_\_\_\_\_.
- e.  $\frac{2}{3} = \frac{\quad}{18}$ ,  $\frac{7}{8} = \frac{\quad}{56}$ ,  $\frac{5}{12} = \frac{35}{\quad}$ ,  $\frac{8}{15} = \frac{40}{\quad}$ ,
- f.  $\frac{23}{46}$  and  $\frac{1}{2}$  are equivalent fractions. True or false? \_\_\_\_\_
- g.  $\frac{5}{9} = \frac{25}{45}$ . True or false? \_\_\_\_\_
- h.  $\frac{28}{42}$  in lowest terms is \_\_\_\_\_ and  $\frac{45}{60}$  in lowest terms is \_\_\_\_\_.
- i. In 63.754, the place value of 6 is \_\_\_\_, that of 7 is \_\_\_\_, that of 5 is \_\_\_\_ and that of 4 is \_\_\_\_.
- j. In the expanded form, 7.284 = \_\_\_\_\_.
- k. 375 rupees 85 paise = ₹ \_\_\_\_\_.

Rs or Re → ₹.



2. Change: a.  $\frac{11}{3}$  and  $\frac{54}{10}$  into mixed fractions      b.  $4\frac{2}{7}$  and  $7\frac{3}{8}$  into improper fractions
- c.  $\frac{2}{3}$  and  $\frac{3}{5}$  into like fractions      d.  $\frac{23}{1000}$  and  $6\frac{3}{10}$  into decimal fractions

### 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. Arrange in descending order: a.  $\frac{4}{15}, \frac{4}{17}, \frac{4}{9}, \frac{4}{7}, \frac{4}{11}$       b.  $\frac{5}{11}, \frac{7}{11}, \frac{8}{11}, \frac{3}{11}, \frac{10}{11}$

6. Arrange in ascending order: a. 2.501, 2.5, 2.05, 2.005, 2.051      b. 0.101, .110, .102, 1.02, 1.021

7. Find: a.  $\frac{4}{9} - \frac{1}{3}$       b.  $\frac{2}{15} + \frac{7}{15}$       c.  $\frac{9}{17} - \frac{11}{17} + \frac{8}{17}$       d.  $85.2 - 75.37$       e.  $52.207 + 13.345$

8. a. If a dozen (12) pens cost ₹ 480, what will be the cost of seven pens?
- b.  $\frac{3}{7}$  of a glass is full. What fraction of the glass is empty?
- c.  $\frac{2}{7}$  of the flowers in a vase are pink,  $\frac{3}{7}$  of them are yellow and the rest are white. If the vase has 21 flowers, how many are white?



## Exercise 1C

### 1. Fill in.

- a.  $20 \text{ mm} = \underline{\hspace{2cm}} \text{ cm}$       b.  $200 \text{ cm} = \underline{\hspace{2cm}} \text{ m}$       c.  $20 \text{ km} = \underline{\hspace{2cm}} \times 1000 \text{ m}$   
d.  $5 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$       e.  $6000 \text{ g} = \underline{\hspace{2cm}} \text{ kg}$       f.  $8000 \text{ ml} = \underline{\hspace{2cm}} \text{ l}$   
g. Time between 2 p.m. and 2 a.m. =  $\underline{\hspace{2cm}}$  hours      h.  $360 \text{ seconds} = \underline{\hspace{2cm}} \text{ min}$   
i.  $5 \text{ weeks} = \underline{\hspace{2cm}} \text{ days}$       j.  $1 \text{ year} \text{ has } \underline{\hspace{2cm}} \text{ weeks}$

2. Change: a. 5 h 10 min to minutes      b. 2 days 7 h to hours      c. 3 months 3 weeks to days  
d. 500 s to minutes and seconds      e. 105 min to h and min      f. 55 h to days and hours

### 3. True or false?

- |  |                          |  |                          |
|--|--------------------------|--|--------------------------|
| a. $75 \text{ cm} = 7 \text{ m } 5 \text{ cm}$     | <input type="checkbox"/> | b. $6 \text{ cm } 9 \text{ mm} = 69 \text{ mm}$      | <input type="checkbox"/> |
| c. $8 \text{ km } 450 \text{ m} = 8450 \text{ m}$  | <input type="checkbox"/> | d. $42 \text{ kg } 59 \text{ g} = 4952 \text{ g}$    | <input type="checkbox"/> |
| e. $6378 \text{ ml} = 6 \text{ l } 378 \text{ ml}$ | <input type="checkbox"/> | f. $25 \text{ l } 345 \text{ ml} = 25345 \text{ ml}$ | <input type="checkbox"/> |
| g. 2016 was a leap year                            | <input type="checkbox"/> | h. 2017 was a leap year                              | <input type="checkbox"/> |

### Do these sums.

4. a.  $5 \text{ cm } 2 \text{ mm} + 16 \text{ cm } 3 \text{ mm} + 24 \text{ cm } 1 \text{ mm}$       b.  $63 \text{ m } 20 \text{ cm} + 35 \text{ m } 73 \text{ cm} + 42 \text{ m } 40 \text{ cm}$   
c.  $6 \text{ km } 102 \text{ m} + 18 \text{ km } 38 \text{ m}$       d.  $168 \text{ m } 29 \text{ cm} + 23 \text{ m } 4 \text{ cm} + 318 \text{ m}$
5. a.  $20 \text{ kg} + 80 \text{ kg } 275 \text{ g} + 350 \text{ g}$       b.  $49 \text{ l } 278 \text{ ml} + 53 \text{ l} + 100 \text{ l } 325 \text{ ml}$   
c.  $8 \text{ kg } 500 \text{ g} + 9 \text{ kg } 63 \text{ g} + 115 \text{ kg } 237 \text{ g} + 48 \text{ kg}$
6. a.  $6 \text{ cm } 8 \text{ mm} - 2 \text{ cm } 6 \text{ mm}$       b.  $6 \text{ m} - 5 \text{ m } 65 \text{ cm}$       c.  $266 \text{ km} - 66 \text{ km } 409 \text{ m}$   
d.  $28 \text{ kg } 580 \text{ g} - 13 \text{ kg } 25 \text{ g}$       e.  $119 \text{ l} - 64 \text{ l } 793 \text{ ml}$
7. a.  $125 \text{ m } 50 \text{ cm} \times 7$       b.  $18 \text{ cm } 9 \text{ mm} \times 6$       c.  $73 \text{ l } 34 \text{ ml} \times 5$   
d.  $23 \text{ km } 142 \text{ m} \times 9$       e.  $232 \text{ kg } 256 \text{ g} \times 4$
8. a.  $496 \text{ l } 880 \text{ ml} \div 16$       b.  $486 \text{ kg } 600 \text{ g} \div 12$       c.  $81 \text{ km } 549 \text{ m} \div 9$   
d.  $243 \text{ m } 28 \text{ cm} \div 8$       e.  $300 \text{ cm } 6 \text{ mm} \div 6$



## Exercise 1D

### 1. Fill in.

- A polygon with 4 sides is called a \_\_\_\_\_.
- A closed shape made with line segments is called a \_\_\_\_\_.
- The entire \_\_\_\_\_ of a circle is called its circumference.
- The diameter of a circle =  $2 \times$  \_\_\_\_\_.
- A line segment from the centre of a circle to a point on the circle is called a \_\_\_\_\_.
- A line segment joining two points on a circle is called a \_\_\_\_\_.

- Draw a circle of radius 5 cm.
  - Draw a line segment of length 6.3 cm.

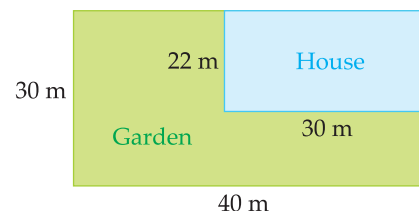
### 3. Find the perimeter and area of a rectangle of sides.

- 3 cm and 7 cm
- 12 m and 24 m

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

- 8 mm
- 15 cm

- A family bought a plot of land of length 40 m and breadth 30 m. They built a rectangular house in one corner, as shown, and made a garden in the remaining part. What is the area of the garden?



- The pictograph shows different flavour of ice-creams sold from a shop in May.



- How many chocolate flavour ice-creams did the shop sell? \_\_\_\_\_
- Which flavour of ice-creams sold the most? \_\_\_\_\_
- Which sold more Butterscotch ice-creams or orange flavour ice-creams? How much more?  
\_\_\_\_\_

## 2. Roman Numerals

There are seven basic Roman Numerals. These numerals with their corresponding Hindu-Arabic numerals are given in the table.

Roman numeral	V	X	L	C	D	M
Value	5	10	50	100	500	1000

There is no symbol for zero in the Roman system.

### Writing Numbers using Roman Numerals

- The numerals I, X, C and M ( 1, 10, 100 and 1000 ) are special. Only they can be placed together ( repeated in a row ) and only they can be subtracted.
- I, X, C and M can be repeated in a row up to three times to form larger numbers. The values of the repeated numerals get added.

$$\text{II} = 1 + 1 = 2$$

$$\text{III} = 1 + 1 + 1 = 3$$

$$\text{XXX} = 10 + 10 + 10 = 30$$

$$\text{CCC} = 100 + 100 + 100 = 300$$

$$\text{MMM} = 1000 + 1000 + 1000 = 3000$$

- A smaller numeral gets added to the greater numeral on its left.

$$\text{VI} = 5 + 1 = 6$$

$$\text{VII} = 5 + 1 + 1 = 7$$

$$\text{VIII} = 5 + 1 + 1 + 1 = 8$$

$$\text{XII} = 10 + 1 + 1 = 12$$

$$\text{XXXI} = 10 + 10 + 10 + 1 = 31$$

$$\text{LX} = 50 + 10 = 60$$

- A smaller numeral gets subtracted from the greater numeral on its right. You can subtract only once from a numeral.

$$\text{IV} = 5 - 1 = 4$$

$$\text{IX} = 10 - 1 = 9$$

$$\text{XL} = 50 - 10 = 40$$

$$\text{XC} = 100 - 10 = 90$$

- A smaller numeral between two greater numerals gets subtracted from the numeral on its right.

$$\text{XXIV} = 10 + 10 + 5 - 1 = 24$$

$$\text{LIX} = 50 + 10 - 1 = 59$$

90 is XC and not LXXXX (more than 3 Xs together).  
80 is LXXX and not XXC (you can subtract only once from a numeral).



To change into Roman numerals, change the tens and ones separately.  
62 = 60 and 2 = LX and II = LXII.





## Numbers 1 to 100 in Roman Numerals.

1 I	2 II	3 III	4 IV	5 V	6 VI	7 VII	8 VIII	9 IX	10 X
11 XI	12 XII	13 XIII	14 XIV	15 XV	16 XVI	17 XVII	18 XVIII	19 XIX	20 XX
21 XXI	22 XXII	23 XXIII	24 XXIV	25 XXV	26 XXVI	27 XXVII	28 XXVIII	29 XXIX	30 XXX
31 XXXI	32 XXXII	33 XXXIII	34 XXXIV	35 XXXV	36 XXXVI	37 XXXVII	38 XXXVIII	39 XXXIX	40 XL
41 XLI	42 XLII	43 XLIII	44 XLIV	45 XLV	46 XLVI	47 XLVII	48 XLVIII	49 XLIX	50 L
51 LI	52 LII	53 LIII	54 LIV	55 LV	56 LVI	57 LVII	58 LVIII	59 LIX	60 LX
61 LXI	62 LXII	63 LXIII	64 LXIV	65 LXV	66 LXVI	67 LXVII	68 LXVIII	69 LXIX	70 LXX
71 LXXI	72 LXXII	73 LXXIII	74 LXXIV	75 LXXV	76 LXXVI	77 LXXVII	78 LXXVIII	79 LXXIX	80 LXXX
81 LXXXI	82 LXXXII	83 LXXXIII	84 LXXXIV	85 LXXXV	86 LXXXVI	87 LXXXVII	88 LXXXVIII	89 LXXXIX	90 XC
91 XCI	92 XCII	93 XCIII	94 XCIV	95 XCV	96 XCVI	97 XCVII	98 XCVIII	99 XCIX	100 C



### Exercise 2A

#### 1. Write using Hindu-Arabic numerals.

a.

XII	XVII	XXVII	XXXIV	XLII	XLIX	XXXI	XLV	XLVI	L

b.

LII	LV	LIX	LXII	LXVI	LXIX	LXXII	LXXIV	LXXIX	LXXX

c.

LXXXII	LXXXIV	LXXXV	LXXXVII	LXXXIX	XC	XCI	XCIV	XCIX	C







2. Write using Roman numerals.

a.	15	18	27	38	26	32	41	45	48





b.	51	53	56	59	61	64	68	72	74

c.	76	78	80	82	83	85	90	99	100

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  $14 \times 7$ | e. $280 \div 4$  LXX | d. $6 \times 8$  XLV |

5. Write in ascending order.

- |                                       |                                   |
|---------------------------------------|-----------------------------------|
| a. XCII, LXXXIX, XC, XLIX, LXVII, XCV | b. LX, XL, XXX, LXIX, LXX, XXXVII |
| _____                                 | _____                             |

6. Write in descending order.

- |  |                                  |
|--|----------------------------------|
| a. XX, LIV, LXVI, LIX, XCVII, LXXXVIII | b. XXI, XV, LIX, LXI, XXIX, XCIX |
| _____                                  | _____                            |

7. Write the answers in Roman numerals.

- |  |  |  |
|--|--|--|
| a. $70 + 8 =$ <input type="text"/>     | b. $5 \times 8 =$ <input type="text"/> | c. $98 \div 2 =$ <input type="text"/>    |
| d. $LXV + XLV =$ <input type="text"/>  | e. $XCII - III =$ <input type="text"/> | f. $LXII - XI =$ <input type="text"/>    |
| g. $V \times X =$ <input type="text"/> | h. $7 \times 9 =$ <input type="text"/> | i. $XLV \div III =$ <input type="text"/> |

## 3. Large Numbers

All counting numbers and the number zero are **whole numbers**.

When we move one step to the left in the place value chart, the value increases 10 times. Similarly, when we move one step to the right, the value decreases 10 times.

Number	Number name
1	One
10	Ten
100	Hundred
1000	Thousand
10,000	Ten thousand
1,00,000	Lakh or <b>hundred thousand</b>
10,00,000	Ten lakh or <b>million</b>
1,00,00,000	Crore or <b>ten million</b>
10,00,00,000	Ten crore or <b>hundred million</b>
100,00,00,000	Hundred crore or <b>billion</b>



### Indian Place-value Chart

You would have noticed that numbers above 10,000 have two different number names. The system of numeration (or naming numbers) in India is different from that of most countries. So, we have two different place-value charts. A place-value chart is divided into a number of periods. In the Indian place-value chart, the ones period has three places: ones, tens and hundreds. All other periods have two places. The number 365498217 is shown below in the Indian place-value chart.

Crores period		Lakhs period		Thousands period		Ones period		
Ten crores (TC)	Crores (C)	Ten lakhs (TL)	Lakhs (L)	Ten thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
3	6	5	4	9	8	2	1	7

$$\text{So, } 365498217 = \underset{30 \text{ crore}}{300000000} + \underset{6 \text{ crore}}{60000000} + \underset{50 \text{ lakh}}{5000000} + \underset{4 \text{ lakh}}{400000} + \underset{90 \text{ thousand}}{90000} + \underset{8 \text{ thousand}}{8000} + \underset{2 \text{ hundred}}{200} + \underset{seventeen}{10} + 7$$

To help us read large numbers, we put commas or spaces to group the digits into periods. **36, 54, 98, 217** Thirty-six crore fifty-four lakh ninety-eight thousand two hundred and seventeen

## International Place-value Chart

In the international place-value chart, all periods have three places. Let us again take the number 365498217 and put it in the international place-value chart.

Millions period			Thousands period			Ones period		
Hundred millions	Ten millions	millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones
3	6	5	4	9	8	2	1	7

$$\text{So, } 365498217 = \underset{\text{300 million}}{300000000} + \underset{\text{60 million}}{60000000} + \underset{\text{5 million}}{5000000} + \underset{\text{400 thousand}}{400000} + \underset{\text{90 thousand}}{90000} + \underset{\text{8 thousand}}{8000} + \underset{\text{2 hundred}}{200} + \underset{\text{seventeen}}{10} + 7$$

Now let us put commas to group the digits into periods according to the international system of numeration. The number name follows this grouping of digits.

**365,498,217** three hundred and sixty-five million four hundred and ninety-eight thousand two hundred and seventeen

Note that in some countries, they do not put the 'and' s in number names.

You might have heard the word billion. It is equal to a thousand million. The place-value chart below has the billions period and shows the number eight billion two hundred and forty-three million.

Billions period			Millions period			Thousands period			Ones period		
Hundred billions	Ten billions	Billions	Hundred millions	Ten millions	Millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones
		8	2	4	3	0	0	0	0	0	0



1 lakh	=	100 thousand
10 lakh	=	1 million
100 lakh or		
1 crore	=	10 million
10 crore	=	100 million
100 crore	=	1 billion

1,000
Thousand has 3 zeros.
1,000,000
Million has 6 zeros.
1,000,000,000
Billion has 9 zeros.

### Writing Large Numbers

- \* Make period blocks according to the system of numeration and fill the places.
- \* Keep all places before the leftmost digit blank.
- \* For no value at a place, write zero.
- \* Finally, write the number with commas or spaces to show the periods.

- a. Five lakh six thousand seven hundred and ninety-two
- b. Sixty-five lakh twenty-one thousand and seventy-four
- c. Twenty-three crore forty-three lakh six hundred and seventy-four

a.

TC	C	TL	L	TTh	Th	H	T	O
			5	0	6	7	9	2

5,06,792 or 506792

b.

TC	C	TL	L	TTh	Th	H	T	O
		6	5	2	1	0	7	4

65,21,074 or 6521074

c.

TC	C	TL	L	TTh	Th	H	T	O
2	3	4	3	0	0	6	7	4

23,43,00,674 or 234300674

- a. One hundred and fifty-two thousand eight hundred and twenty-six
- b. Two million five hundred and forty thousand and seven
- c. Four hundred and six million three hundred and thirty-two thousand five hundred
- d. Five billion three hundred and eighty-six million

a.

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O
						1	5	2	8	2	6

152,826 or 152826

b.

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O
					2	5	4	0	0	0	7

2,540,007 or 2540007

c.

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O
			4	0	6	3	3	2	5	0	0

406,332,500 or 406332500

d.

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O
		5	3	8	6	0	0	0	0	0	0

5,386,000,000 or 5386000000

### Writing the Number Names of Large Numbers

- \* Move right to left, marking the periods with commas according to the system of numeration.
- \* The numbers in the periods give the number name.



- Name 325470010 according to (a) the Indian system and (b) the international system.

a. 32,54,70,010: **Thirty-two crore fifty-four lakh seventy thousand and ten**

b. 325,470,010: **Three hundred and twenty-five million four hundred and seventy thousand and ten**

## Large Numbers in the Expanded Form

$$28,306 = 20000 + 8000 + 300 + 0 + 6$$

$$4,68,351 = 400000 + 60000 + 8000 + 300 + 50 + 1$$

$$6,10,805 = 600000 + 10000 + 0 + 800 + 0 + 5$$

$$72,83,624 = 7000000 + 200000 + 80000 + 3000 + 600 + 20 + 4$$

$$5,68,73,452 = 50000000 + 6000000 + 800000 + 70000 + 3000 + 400 + 50 + 2$$

$$31,24,60,186 = 300000000 + 10000000 + 2000000 + 400000 + 60000 + 0 + 100 + 80 + 6$$



### Exercise 3A

#### 1. Write in the short form.

a.  $70000 + 6000 + 500 + 40 + 3 =$

b.  $800000 + 60000 + 4000 + 200 + 40 + 1 =$

c.  $3000000 + 400000 + 20000 + 6000 + 400 + 20 + 8 =$

d.  $50000000 + 1000000 + 400000 + 80000 + 6000 + 100 + 10 + 4 =$

e.  $100000000 + 30000000 + 2000000 + 0 + 40000 + 2000 + 0 + 50 + 7 =$

f.  $80000000 + 7000000 + 400000 + 0 + 5000 + 200 + 30 + 6 =$

g.  $2000000 + 0 + 60000 + 1000 + 700 + 40 + 5 =$

#### 2. Write in the expanded form.

a.  $28,524 =$

b.  $1,61,087 =$

c.  $38,42,321 =$

d.  $6,26,08,512 =$

e.  $44,68,00,201 =$

f.  $76,08,08,245 =$

g.  $51,15,618 =$



3. Write in figures.

a. Forty thousand six hundred and twenty-four

TC	C	TL	L	TTh	Th	H	T	O

b. Three lakh forty-one thousand two hundred and sixty-six

TC	C	TL	L	TTh	Th	H	T	O

c. Eighty-four lakh seventy-six thousand five hundred and ninety

TC	C	TL	L	TTh	Th	H	T	O

d. Two crore fifty lakh sixty thousand four hundred and thirty-three

TC	C	TL	L	TTh	Th	H	T	O

e. Nineteen crore eighty-two lakh three thousand one hundred and fifty-five

TC	C	TL	L	TTh	Th	H	T	O

4. Write in figures.

a. Two hundred and forty-three thousand

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

b. Six hundred thousand two hundred and twenty-two

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

c. Five million two hundred thousand nine hundred and sixteen

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

d. Ninety-one million five hundred and two thousands six hundred and eight

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

e. Eight billion seventy-five million.

HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

5. Write in figures in your notebook.

a. Four lakh thirty-eight thousand two hundred and sixty-two

b. Sixty-three lakh four thousand eight hundred and thirty-seven

c. Two crore eight lakh thirty-four thousand one hundred and four

d. Eighty-six crore eighty-six thousand three hundred

e. Three hundred and twenty-one thousand five hundred and forty-one

f. One million seventy-three thousand six hundred and sixty-six

g. Seventy-two million four hundred and eighteen thousand two hundred and two

h. Five billion eight million forty thousand two hundred and eighty-one

6. Write in words using the Indian system of numeration.

- a. 48732                      b. 50050                      c. 353627                      d. 603215                      e. 3932000  
f. 8430347                      g. 68346582                      h. 53804000                      i. 362040861                      j. 400607080

7. Write the number names using the international system of numeration.

- a. 326831                      b. 601275                      c. 6436955                      d. 9075300                      e. 47600000  
f. 8430347                      g. 68346582                      h. 384271014                      i. 3060070000                      j. 5164334138

8. Rewrite the numbers with commas separating the periods using first the Indian system and then the international system of numeration.

- a. 623467                      b. 543468                      c. 2465704                      d. 4647480                      e. 4074023  
f. 33682792                      g. 666666                      h. 32800623                      i. 286237428                      j. 650002035

9. Write four consecutive numbers that come after.

- a. 68,586                      \_\_\_\_\_  
b. 2,38,887                      \_\_\_\_\_  
c. 18,62,388                      \_\_\_\_\_  
d. 4,73,00,602                      \_\_\_\_\_  
e. 55,02,84,000                      \_\_\_\_\_

10. Write the predecessor of.

- a. \_\_\_\_\_ 76,000                      b. \_\_\_\_\_ 2,52,000                      c. \_\_\_\_\_ 4,80,102  
d. \_\_\_\_\_ 71,30,000                      e. \_\_\_\_\_ 6,35,18,212                      f. \_\_\_\_\_ 22,34,82,079

11. Write the successor of.

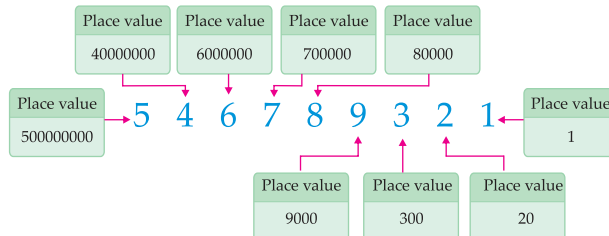
- a. 38,000 \_\_\_\_\_                      b. 57,089 \_\_\_\_\_                      c. 7,29,999 \_\_\_\_\_  
d. 46,52,704 \_\_\_\_\_                      e. 5,09,99,999 \_\_\_\_\_                      f. 27,00,04,009 \_\_\_\_\_

## Writing Place Values

Let us put the digits of 54,67,89,321 in a place-value chart.

TC	C	TL	L	TTh	Th	H	T	O
5	4	6	7	8	9	3	2	1

$$\begin{aligned}
 546789321 &= 5 \text{ ten crores} + 4 \text{ crores} + 6 \text{ ten lakhs} + 7 \text{ lakhs} \\
 &\quad + 8 \text{ ten thousands} + 9 \text{ thousands} + 3 \text{ hundreds} \\
 &\quad + 2 \text{ tens} + 1 \text{ one} \\
 &= 500000000 + 40000000 + 6000000 + 700000 \\
 &\quad + 80000 + 9000 + 300 + 20 + 1.
 \end{aligned}$$



## Comparing and Arranging

To compare numbers, move left to right, comparing the digits at each place.

If the digits at a place are equal, compare the digits at the next place on the right.

Numbers with more digits are larger.



TC	C	TL	L	TTh	Th	H	T	O	TC	C	TL	L	TTh	Th	H	T	O
3	6	7	8	4	2	1	1	0	3	6	7	8	4	2	1	1	1

$$\text{TC: } 3 > 0$$

$$367842110 > 36784211$$

(Also because 367842110 has more digits than 36784211.)

TC	C	TL	L	TTh	Th	H	T	O	TC	C	TL	L	TTh	Th	H	T	O
9	8	7	6	5	4	3	2	1	9	8	7	3	6	4	3	2	1

$$\begin{aligned}
 \text{TC: } 9 &= 9 \quad \text{C: } 8 = 8 \quad \text{TL: } 7 = 6 \quad \text{L: } 6 > 3 \\
 987654321 &> 987364321
 \end{aligned}$$

C	TL	L	TTh	Th	H	T	O	C	TL	L	TTh	Th	H	T	O
3	8	9	5	6	4	7	7	3	8	9	6	5	4	7	

$$\begin{aligned}
 \text{TL: } 3 &= 3 \quad \text{L: } 8 = 8 \quad \text{TTh: } 9 = 9 \quad \text{Th: } 5 > 6 \\
 3895647 &< 3896547
 \end{aligned}$$

- Arrange in ascending order (from the smallest to the largest):

3,43,546   34,354   3,43,564   43,564   33,46,465   33,11,342

34,354   43,564   3,43,546   3,43,564   33,11,342   33,46,465

- Arrange in descending order (from the largest to the smallest):

22,567   5,081   4,46,785   22,16,43,128   5,70,04,301   57,04,682

22,16,43,128   5,70,04,301   57,04,682   4,46,785   22,567   5,081



## Making the Smallest and the Greatest Numbers with Given Digits

### Making the Greatest Number with Given Digits

To make the greatest number with given digits, write the digits in order from the greatest to the smallest (descending order). Keep equal digits together.

Given digits: 6,9,8,6,3,0,7,2  
Greatest number  
with these digits: 98766320

### Making the Smallest Number with Given Digits

Write the digits in order from the smallest to the largest (ascending order). As 034 is 34, you cannot start numbers with zeros. If there are zeros, place them after the next-smallest digits.

Given digits: 3,8,4,1,0,5,9,0  
Greatest number  
with these digits: 10034589



### Exercise 3B

#### 1. Fill in.

- In 638972, 6 is in the \_\_\_\_\_ place, and 8 is in the \_\_\_\_\_ place.
- In 4752231, 4 is in the \_\_\_\_\_ place, and 5 is in the \_\_\_\_\_ place.
- In 34659807, 3 is in the \_\_\_\_\_ place, and 6 is in the \_\_\_\_\_ place.
- In 598743, the digit in the lakhs place is \_\_\_\_\_, and its place value is \_\_\_\_\_.
- In 8634590, the digit in the ten lakhs place is \_\_\_\_\_, and its place value is \_\_\_\_\_.
- In 75094386, the digit in the crores place is \_\_\_\_\_, and that in the ten lakhs place is \_\_\_\_\_.
- In 2080400, the place value of 2 is \_\_\_\_\_, and that of 8 is \_\_\_\_\_.
- In 71605802, the place value of 7 is \_\_\_\_\_, and that of 6 is \_\_\_\_\_.

#### 2. Write the place value of the given digits.

- 41,863      4 \_\_\_\_\_      1 \_\_\_\_\_      8 \_\_\_\_\_      3 \_\_\_\_\_
- 47,902      2 \_\_\_\_\_      9 \_\_\_\_\_      7 \_\_\_\_\_      4 \_\_\_\_\_
- 3,74,586      3 \_\_\_\_\_      7 \_\_\_\_\_      4 \_\_\_\_\_      5 \_\_\_\_\_

- d. 7,43,658    3 \_\_\_\_\_    7 \_\_\_\_\_    4 \_\_\_\_\_    5 \_\_\_\_\_
- e. 52,31,048    1 \_\_\_\_\_    5 \_\_\_\_\_    2 \_\_\_\_\_    3 \_\_\_\_\_
- f. 76,82,310    7 \_\_\_\_\_    6 \_\_\_\_\_    2 \_\_\_\_\_    8 \_\_\_\_\_
- g. 68,54,702    7 \_\_\_\_\_    6 \_\_\_\_\_    2 \_\_\_\_\_    0 \_\_\_\_\_
- h. 3,26,87,451    3 \_\_\_\_\_    2 \_\_\_\_\_    6 \_\_\_\_\_    8 \_\_\_\_\_
- i. 14,32,48,007    1 \_\_\_\_\_    4 \_\_\_\_\_    3 \_\_\_\_\_    2 \_\_\_\_\_
- j. 28,03,70,450    2 \_\_\_\_\_    8 \_\_\_\_\_    3 \_\_\_\_\_    7 \_\_\_\_\_

3. Write  $>$ ,  $<$  or  $=$ .

- a. 38,476 ● 38,467      b. 3,34,485 ● 334485      c. 478672 ● 578672
- d. 2 00 00 000 ● 20 00 00 000      e. 32,47,286 ● 3,24,72,000      f. 82,28,282 ● 8 28 228
- g. 6,000,000 ● 60,00,000      h. 7,89,63,453 ● 78 963 988      i. 832967 ● 8 32 967
- j. 8 888 777 ● 8,88,88,777      k. 2,44,55,696 ● 23,45,98,679      l. 4020309 ● 42 03 090

4. Write the smallest and the largest numbers.

- |    |              |           |            |              | Smallest    | Largest |
|----|--------------|-----------|------------|--------------|-------------|---------|
| a. | 6 72 841     | 76 85 126 | 67 89 508  | 7 65 932     | 6 83 493    |         |
| b. | 4,56,259     | 3,97,430  | 99,999     | 4,67,823     | 3,48,737    |         |
| c. | 300,000      | 3,000,000 | 30,000,000 | 5,000,000    | 500,000     |         |
| d. | 2,22,22,222  | 2,22,222  | 22,22,222  | 22,22,22,222 | 22,222      |         |
| e. | 52 63 74 859 | 52 63 748 | 74 85 923  | 3 62 73 845  | 4 22 27 352 |         |

5. Write in descending order.

- a. 

25,632	59,741	5,63,409	25,77,889	75,00,000
--------	--------	----------	-----------	-----------

 \_\_\_\_\_
- b. 

72,897	82,567	28,493	35,227	73,642
--------	--------	--------	--------	--------

 \_\_\_\_\_
- c. 

6 42 589	4 39 571	6 49 700	7 80 900	6 43 826
----------	----------	----------	----------	----------

 \_\_\_\_\_
- d. 

1,45,28,302	2,65,49,000	1 50 45 369	21 72 603	1 23 36 408
-------------	-------------	-------------	-----------	-------------

 \_\_\_\_\_
- e. 

9504 020	9 50 420	9540 002	95 40 378	9 59 784
----------	----------	----------	-----------	----------

 \_\_\_\_\_

6. Write in ascending order.

- a. 

89,10,123	9,75,342	71,421	56,64,248	8,16,324
-----------	----------	--------	-----------	----------

 \_\_\_\_\_
- b. 

7 42 503	5 520	63825	9316224	84 20 369
----------	-------	-------	---------	-----------

 \_\_\_\_\_
- c. 

12 24 360	9 18 27 364	48 16 203	6 12 182	24 50 071
-----------	-------------	-----------	----------	-----------

 \_\_\_\_\_
- d. 

9 18 36 643	5 15 45 135	2,18,14,121	3,27,18,396	3,61,22,481
-------------	-------------	-------------	-------------	-------------

 \_\_\_\_\_
- e. 

4,36,00,000	5,45,00,000	2,18,14,121	3,27,18,396	3,61,22,481
-------------	-------------	-------------	-------------	-------------

 \_\_\_\_\_

7. Make the greatest and the smallest numbers using all the given digits.

- |   | Greatest number | Smallest number |   |   |   |   |   |   |       |       |
|---|-----------------|-----------------|---|---|---|---|---|---|-------|-------|
| a. <table border="0" style="display: inline-table;"><tr><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">3</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">1</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">7</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">2</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">5</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">4</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;"> </td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;"> </td></tr></table> | 3               | 1               | 7 | 2 | 5 | 4 |   |   | _____ | _____ |
| 3   | 1               | 7               | 2 | 5 | 4 |   |   |   |       |       |
| b. <table border="0" style="display: inline-table;"><tr><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">6</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">4</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">7</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">3</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">5</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">1</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">0</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;"> </td></tr></table> | 6               | 4               | 7 | 3 | 5 | 1 | 0 |   | _____ | _____ |
| 6   | 4               | 7               | 3 | 5 | 1 | 0 |   |   |       |       |
| c. <table border="0" style="display: inline-table;"><tr><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">0</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">2</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">4</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">6</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">8</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">9</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">0</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;"> </td></tr></table> | 0               | 2               | 4 | 6 | 8 | 9 | 0 |   | _____ | _____ |
| 0   | 2               | 4               | 6 | 8 | 9 | 0 |   |   |       |       |
| d. <table border="0" style="display: inline-table;"><tr><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">9</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">7</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">5</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">5</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">3</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">4</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">6</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">8</td></tr></table> | 9               | 7               | 5 | 5 | 3 | 4 | 6 | 8 | _____ | _____ |
| 9   | 7               | 5               | 5 | 3 | 4 | 6 | 8 |   |       |       |
| e. <table border="0" style="display: inline-table;"><tr><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">5</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">4</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">7</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">8</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">7</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">6</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">0</td><td style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">1</td></tr></table> | 5               | 4               | 7 | 8 | 7 | 6 | 0 | 1 | _____ | _____ |
| 5   | 4               | 7               | 8 | 7 | 6 | 0 | 1 |   |       |       |



# 4. Operations with Large Numbers

## Addition

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



Add, subtract, multiply and divide large numbers in the same way you do these operations with smaller numbers.



sum - one number = the other number

$$3120 + 3236 = 6356 \text{ (sum)}$$

$$5245 - 3120 = 2125$$

$$7467 - 3236 = 4231$$

+ Fill in the missing digits.

	L	TTh	Th	H	T	O
2	2	□	6	3	3	
+	4	1	5	□	1	5
+	3	3	8	9	2	1
9	□	0	6	6	9	

1 T: Sum is 6.  
One number in the sum is 4 (3 + 1). The other number is 6 - 4 = 2.



2	2	□	6	3	3
+	4	1	5	1	5
+	3	3	8	9	2
9	□	0	6	6	9

2 H: 6 + 9 = 15  
As 15 > 6, the sum must be 16.  
16 - 15 = 1



2	2	6	6	3	3
+	4	1	5	1	5
+	3	3	8	9	2
9	□	0	6	6	9

3 Th: 1 + 5 + 8 = 14  
As 14 > 0, the sum must be 20.  
20 - 14 = 6



2	2	6	6	3	3
+	4	1	5	1	5
+	3	3	8	9	2
9	8	0	6	6	9

4 TTh: 2 + 2 + 1 + 3 = 8



## Subtraction

$$\begin{array}{r}
 8675 \leftarrow \text{Minuend} \\
 - 1243 \leftarrow \text{Subtrahend} \\
 \hline
 7432 \leftarrow \text{Difference}
 \end{array}$$

\* difference = minuend - subtrahend  
\* subtrahend = minuend - difference  
\* minuend = difference + subtrahend



✦ Subtract and check the answer.

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

As  $2578018 + 145682 = 2723700$ , the answer is correct.

You should practice borrowing and carrying in your head.



✦ Fill in the missing digits.

$$\begin{array}{r}
 \begin{array}{cccccc}
 & L & TTh & Th & H & T & O \\
 7 & \square & 2 & \square & 9 & 0 & \\
 - & 2 & 5 & \square & 7 & 3 & 1 \\
 \hline
 \square & 2 & 5 & 5 & 5 & 9 & 
 \end{array}
 \end{array}$$

**1**  
**O:** Borrow 1 ten, leaving 8 at **T**.  
**T:**  $8 - ? = 5$   
 Write **3** as  
 $8 - 5 = 3$ .



$$\begin{array}{r}
 \begin{array}{cccccc}
 & L & TTh & Th & H & T & O \\
 7 & 8 & 2 & 2 & 9 & 0 & \\
 - & 2 & 5 & 6 & 7 & 3 & 1 \\
 \hline
 5 & 2 & 5 & 5 & 5 & 9 & 
 \end{array}
 \end{array}$$

**2**  
**H:** Minuend =  $7 + 5 = 12$ . Write 2. Carry 1 and add to the difference.  
**Th:**  $2 - ? = 5 + 1$ . Borrow to make  $12 - ? = 6$ .  $12 - 6 = 6$ .  
**TTh:** Minuend =  $5 + 2 = 7$ . But 1 was borrowed from this place. So, the number is  $7 + 1 = 8$ .



You can write the sum as an addition sum to find the missing digits.

$$\begin{array}{r}
 7 \square 2 \square 9 0 \\
 - 2 5 \square 7 \square 1 \\
 \hline
 \square 2 5 5 5 9
 \end{array}$$

Change

$$\begin{array}{r}
 \square 2 5 5 5 9 \\
 + 2 5 \square 7 \square 1 \\
 \hline
 7 \square 2 \square 9 0
 \end{array}$$

Change back

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

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

✦ Simplify:  $45873 - 236705 + 574529 - 58965$ .

**1** Add the '-' numbers. **2** Add the other numbers. **3** From their sum, subtract the sum of the '-' numbers.

**1**

$$\begin{array}{r}
 236705 \\
 + 58965 \\
 \hline
 295670
 \end{array}$$

**2**

$$\begin{array}{r}
 574529 \\
 + 45873 \\
 \hline
 620402
 \end{array}$$

**3**

$$\begin{array}{r}
 620402 \\
 - 295670 \\
 \hline
 324732
 \end{array}$$

Answer





## Exercise 4A

### 1. Add.

a.

$$\begin{array}{r} 4270756 \\ + 38607342 \\ + 38426450 \\ \hline \end{array}$$

b.

$$\begin{array}{r} 64171042 \\ + 72529653 \\ + 53368337 \\ \hline \end{array}$$

c.

$$\begin{array}{r} 44158760 \\ + 223507214 \\ + 150764326 \\ \hline \end{array}$$

d.

$$\begin{array}{r} 52332 \\ + 201547 \\ + 3447410 \\ + 36533228 \\ \hline \end{array}$$

e.

$$\begin{array}{r} 102810835 \\ + 83634720 \\ + 44527390 \\ + 205160155 \\ \hline \end{array}$$

f.

$$\begin{array}{r} 134706124 \\ + 45040423 \\ + 3532248 \\ + 523598 \\ \hline \end{array}$$

### 2. Arrange in columns and add.

a. 2038, 473182 and 6225281

b. 5454, 457639 and 26389405

c. 72560814 and 9483526

### 3. Subtract and check the answer:

a.

$$\begin{array}{r} 5243706 \\ - 461387 \\ \hline \end{array}$$

b.

$$\begin{array}{r} 25305230 \\ - 6909544 \\ \hline \end{array}$$

c.

$$\begin{array}{r} 40357420 \\ - 26697638 \\ \hline \end{array}$$

4. a. Subtract 2635845 from 10101010.

b. Subtract 340789 from 2001005.

c. Subtract forty-seven lakh five thousand six hundred and eighty-eight from one crore.

### Fill in the missing digits.

5. a.

$$\begin{array}{r} 154\boxed{\phantom{0}}13 \\ + 3536\boxed{\phantom{0}} \\ + \boxed{\phantom{0}}465\boxed{\phantom{0}}2 \\ \hline 4\boxed{\phantom{0}}\boxed{\phantom{0}}028 \end{array}$$

b.

$$\begin{array}{r} 2\boxed{\phantom{0}}6\boxed{\phantom{0}}6\boxed{\phantom{0}}5 \\ + \boxed{\phantom{0}}7\boxed{\phantom{0}}554\boxed{\phantom{0}} \\ + 304\boxed{\phantom{0}}93 \\ \hline 6290501 \end{array}$$

c.

$$\begin{array}{r} 81672842 \\ + 8\boxed{\phantom{0}}04\boxed{\phantom{0}}5\boxed{\phantom{0}} \\ + \boxed{\phantom{0}}75\boxed{\phantom{0}}253 \\ \hline \boxed{\phantom{0}}48\boxed{\phantom{0}}94\boxed{\phantom{0}}1 \end{array}$$

6. a.

$$\begin{array}{r} 356\boxed{\phantom{0}}82 \\ - 2\boxed{\phantom{0}}551\boxed{\phantom{0}} \\ \hline \boxed{\phantom{0}}1\boxed{\phantom{0}}5\boxed{\phantom{0}}5 \end{array}$$

b.

$$\begin{array}{r} 5\boxed{\phantom{0}}4\boxed{\phantom{0}}5\boxed{\phantom{0}}0 \\ - \boxed{\phantom{0}}3\boxed{\phantom{0}}6\boxed{\phantom{0}}1\boxed{\phantom{0}} \\ \hline 3013796 \end{array}$$

c.

$$\begin{array}{r} 60000000 \\ - 3\boxed{\phantom{0}}4\boxed{\phantom{0}}2\boxed{\phantom{0}}1\boxed{\phantom{0}} \\ \hline \boxed{\phantom{0}}3\boxed{\phantom{0}}5\boxed{\phantom{0}}4\boxed{\phantom{0}}6 \end{array}$$

## 7. Simplify.

a.  $25004130 - 5654138 + 3138$

b.  $426624 + 253886 - 305167$

c.  $841250 - 1236045 + 689510 - 45720$

d.  $18402013 - 6641325 - 382047 + 38204$

More sums for practice



## Find.

8. a.  $3845763 + 2438172 + 8360274$     b.  $12687345 + 76543231$     c.  $7320543 + 6493226 + 5463$

d.  $52047961 + 8625245 + 32640$     e. Twenty crore seventy-five thousand + ninety lakh

9. a.  $3000000 - 620534$

b.  $237851 - 76955$

c.  $10020030 - 4430079$

d.  $90807060 - 60958273$

e.  $52960010 - 8438215$

10. a.  $1245 - 847521 + 1245000 - 307583$     b.  $73940052 - 9998798 - 752826$

## Word Problems

- What must be added to 56,783 to get 2,49,594? (How much is 56,783 short of 2,49,594?)

The number =  $249594 - 56783$ .

$$\begin{array}{r} 249594 \\ - 56783 \\ \hline 192811 \end{array}$$

∴ the number to be added is 1,92,811.

- The difference of two numbers is 4,57,894. The smaller number is 39,216. Find the larger number.

The larger number =  $457894 + 39216$ .

$$\begin{array}{r} 457894 \\ + 39216 \\ \hline 497110 \end{array}$$

∴ the larger number is 4,97,110.

- Savita bought 2 diamond rings for ₹ 1,39,500. She sold one of them for ₹ 75,000 and the other one for ₹ 80,000. How much money did she gain? (What was her profit?)

The cost of the diamond rings = ₹ 139500.

The price at which they were sold = ₹ 75000 + ₹ 80000

= ₹ 155000.

As the selling price was more than the cost price, Savita gained money (she made a profit).

Money gained (profit) = ₹ 155000 - ₹ 139500

= ₹ 1,55,000.

$$\begin{array}{r} 75000 \\ + 80000 \\ \hline 155000 \end{array}$$

$$\begin{array}{r} 155000 \\ - 139500 \\ \hline 15500 \end{array}$$

- Vijay had 2 computers. Each computer cost ₹ 84,000. He sold them together for ₹ 1,58,750. Did he gain or lose money? Find his profit or loss.

Cost of the two computers = ₹ 84000 + ₹ 84000  
= ₹ 168000.

The computers were sold together for ₹ 158750.  
Their selling price was less than their cost price.  
So, Vijay lost money on the sale.

His loss = ₹ 168000 - ₹ 158750  
= ₹ 9,250.

$$\begin{array}{r} 168000 \\ -158750 \\ \hline 9250 \end{array}$$



### Exercise 4B

- The sum of 2,46,745 and a number is 18,27,225. Find the number.
- a. How much is 6 crore more than five lakh seventy-eight thousand?  
b. What must be added to 7962360 to make it equal to 8000000?
- The difference of two numbers is 3,25,066. If the smaller number is 98,437, find the larger one.
- The difference of two numbers is 2,11,265. The bigger number is 50,02,000. Find the smaller number.
- What number should be subtracted from the sum of 8,93,645 and 6,35,489 to get 10,00,000?
- The population of a metropolitan city is 1,54,23,840. If out of this 79,83,115 are males, how many females are there in the city?
- A man bought a piece of land for ₹ 8,53,760. He spent ₹ 15,46,920 to build a house on it. After that he sold the house for ₹ 30,00,000. How much money did he gain?
- A man had ₹ 1,00,00,000. He spent ₹ 12,60,750 to buy a car, ₹ 52,53,600 to buy a flat and ₹ 5,68,440 to furnish the flat. How much money was left with him?
- A state has 1,43,34,516 male voters and 1,35,87,645 female voters. In an election 8,65,079 voters did not vote. How many people cast their vote in the election?
- Sanjay bought a house for ₹ 2,57,89,500 and sold it for ₹ 2,75,20,000. Did he gain or lose money? Find his profit or loss.
- Nisha bought a flat for ₹ 15,44,782. She had to sell it for ₹ 12,55,000. Did she gain or lose money? Find her profit or loss.

## Multiplication and Division

- Multiply 25234 by 1807.

$$\begin{array}{r}
 25234 \\
 \times 1807 \\
 \hline
 176638 \\
 000000 \\
 20187200 \\
 25234000 \\
 \hline
 45597838
 \end{array}$$

You can write such sums in two different ways.



$$\begin{array}{r}
 25234 \\
 \times 1807 \\
 \hline
 176638 \\
 000000 \\
 201872 \\
 25234 \\
 \hline
 45597838
 \end{array}$$

- Divide 53974 by 87 and check the answer.

			6	2	0	4		
8	7		5	3	9	7	4	9
			-5	2	2			
				1	7	7		
				-1	7	4		
						3	4	9
						-3	4	8
								1

- 1 Think  $53 \div 8 = ?$        $8 \times 7 = 56$        $8 \times 6 = 48$   
So, find  $87 \times 6$ . It is 522. For this step, Q = 6, R = 17.
- 2 Bring down 7 to make 177. Think  $17 \div 8 = ?$        $8 \times 2 = 16$   
So, find  $87 \times 2$ . It is 174. For this step, Q = 2, R = 3.
- 3 Bring down 4.       $34 \div 87 \times$       So, Q = 0, R = 34.
- 4 Bring down 9 to make 349.  
 $349 \div 87$ : Q = 4, R = 1.



Quotient = 6,204, remainder = 1. The answer is correct if dividend = divisor  $\times$  quotient + remainder.  
 $87 \times 6204 + 1 = 539749$ . So the answer is correct.

- Divide 7505486 by 249.

					3	0	1	4	2	
2	4	9		7	5	0	5	4	8	6
				-7	4	7				
						3	5	4		
						-2	4	9		
						1	0	5	8	
							-9	9	6	
								6	2	6
								-4	9	8
								1	2	8

Quotient = 30,142, remainder = 128.

- Divide 105433779 by 3459.

								3	0	4	8	1	
3	4	5	9		1	0	5	4	3	3	7	7	9
					-1	0	3	7	7				
							1	6	6	3	7		
							-1	3	8	3	6		
								2	8	0	1	7	
								-2	7	6	7	2	
									3	4	5	9	
									-3	4	5	9	
													0

Quotient = 30,481, remainder = 0.





## Exercise 4C

### Multiply.

1. a. 

7 8 9 3 5
× 8 6

b. 

3 2 8 9 3
× 9 7 5

c. 

5 9 8 3
× 2 7 6 9

2. a.  $14574 \times 48$

b.  $70624 \times 72$

c.  $263078 \times 55$

3. a.  $6549 \times 345$

b.  $3542 \times 635$

c.  $30431 \times 540$

4. a.  $2638 \times 1523$

b.  $2386 \times 3072$

c.  $32547 \times 1208$

5. a.  $3429 \times 1510$

b.  $3516 \times 2500$

c.  $468 \times 12000$



### Divide.

6. a. 

8 7	6 7 8 6				
Quotient =					
Remainder =					

b. 

2 4 3	2 1 1 4 6				
Quotient =					
Remainder =					

c. 

3 7 2 5	9 0 5 1 7 5				
Quotient =					
Remainder =					

7. a.  $4018 \div 18$

b.  $11250 \div 45$

c.  $86172 \div 43$

8. a.  $278382 \div 86$

b.  $3543305 \div 58$

c.  $10000000 \div 58$

9. a.  $2898 \div 123$

b.  $8470 \div 145$

c.  $31140 \div 215$

10. a.  $449060 \div 435$

b.  $225828 \div 225$

c.  $336511 \div 335$

11. a.  $7071463 \div 642$

b.  $3840354 \div 743$

c.  $20104384 \div 918$



12. a.  $1357541 \div 1143$       b.  $62648003 \div 2115$       c.  $53617826 \div 3155$   
 13. a.  $724350 \div 3200$       b.  $12345678 \div 10000$       c.  $31056827 \div 4000$

More sums for practice



### Multiply.

14. a.  $24612 \times 23$       b.  $34970 \times 65$       15. a.  $35012 \times 143$       b.  $24681 \times 352$   
 16. a.  $26786 \times 2345$       b.  $30569 \times 3352$       17. a.  $46329 \times 1500$       b.  $53761 \times 4050$

### Divide.

18. a.  $7704 \div 24$       b.  $15120 \div 36$       c.  $256114 \div 55$       d.  $5307104 \div 88$   
 19. a.  $17134 \div 318$       b.  $52251 \div 442$       c.  $20496 \div 836$       d.  $21216 \div 663$   
 20. a.  $1920399 \div 3334$       b.  $14008586 \div 4050$       c.  $35941894 \div 7256$       d.  $1741500 \div 4500$

## Word Problems

- A society has 85 buildings. Each building has 48 floors. Each floor has 64 flats. How many flats are there in the society?

The number of buildings = 85. Number of floors in each building = 48.  
 Total number of floors =  $85 \times 48 = 4080$ .  
 Number of flats on each floor = 64.  
 Total number of flats in the society =  $4080 \times 64 = 2,61,120$ .

$$\begin{array}{r} 85 \\ \times 48 \\ \hline 680 \\ 340 \phantom{0} \\ \hline 4080 \end{array} \qquad \begin{array}{r} 4080 \\ \times 64 \\ \hline 16320 \\ 24480 \phantom{0} \\ \hline 261120 \end{array}$$

- A number divided by 3578 gives 34 as quotient and 18 as remainder. Find the number.

Divisor = 3578, quotient = 34, remainder = 18, dividend = ?  
 Dividend = divisor  $\times$  quotient + remainder  
 =  $3578 \times 34 + 18 = 121652 + 18 = 121670$ .

The number is 1,21,670..

$$\begin{array}{r} 3578 \\ \times 34 \\ \hline 14312 \\ 10734 \phantom{0} \\ \hline 121652 \\ + 18 \\ \hline 121670 \end{array}$$

- Find the greatest number of 5 digits that is divisible by 25.

The greatest number of 5 digits = 99999.  
 Dividing 99999 by 25 leaves 24 as remainder.  
 So, a number that is 24 less than 99999 is divisible by 25.  
 $99999 - 24 = 99975$ .

The greatest 5-digit number divisible by 25 is 99,975.

24 is 'extra'



$$\begin{array}{r} 3999 \\ 25 \overline{) 99999} \\ \underline{- 75} \phantom{00} \\ 249 \phantom{0} \\ \underline{- 225} \phantom{0} \\ 249 \phantom{0} \\ \underline{- 225} \phantom{0} \\ 249 \phantom{0} \\ \underline{- 225} \phantom{0} \\ 24 \end{array}$$

- Find the smallest number of 6 digits that is divisible by 132.

The smallest number of 6 digits = 100000.

Dividing 100000 by 132 leaves 76 as remainder.

So, a number that is 76 less than 100000 is divisible by 132.

$100000 - 76 = 99924$ . But 99924 is a 5-digit number.

The next number divisible by 132 =  $99924 + 132 = 100056$ .

The smallest 6-digit number divisible by 132 is 1,00,056.

$$\begin{array}{r}
 757 \\
 132 \overline{) 100000} \\
 \underline{- 924} \phantom{00} \\
 760 \\
 \underline{- 660} \\
 1000 \\
 \underline{- 924} \\
 76
 \end{array}$$



### Exercise 4D

- Shikha can type 82 words per minute. How many words will she type in 4 weeks if she types daily for 6 hours 40 minutes?
- A milk dairy produce 3875 litres of milk daily. Find the total production in the first two months of the year 2016.
- Find the product of the least odd number of 5-digits and the largest number of 3-digits.
- Find the dividend when the divisor = 88, the quotient = 2470 and the remainder = 25.
  - Find the number which when divided by 256 gives 652 as quotient and no remainder.
- The price of a toy is ₹ 86. How many of these can a shopkeeper buy with ₹ 3,000?
  - The price of a book is ₹ 364. What is the price of 245 such books?
- The greatest four-digit number made with the digits 1, 0, 9, 2 is divided by the smallest three-digit number made with 1, 9, 2. Find the quotient and the remainder.
  - Find the product of the greatest and the smallest three-digit numbers made with the digits 5, 2 and 9.
- If the farm needs to pack 12,70,224 litchis in boxes that hold 144 litchis, how many boxes would be required?
  - The litchis from a farm were packed in boxes that hold 144 litchis. If 2,125 boxes were used, how many litchis were packed?



8. There are 2597 students on the rolls of a school. If each student pay ₹ 4255 as fees half-yearly, how much money is collected in a year?
9. How many hours are there in 538020 minutes.
10. Find the smallest 6-digit number that is divisible by 436.



## Simplification

You know the operations addition, subtraction, multiplication and division. You also know the operation called 'of'. 12 of 1257 means 12 times of 1257, that is,  $12 \times 1257$ .

In a simplification sum, the order in which the operations are to be done is given by **ODMAS**:

**1** Of    **2** Division    **3** Multiplication    **4** Addition    **5** Subtraction

- Simplify  $7829 - 15 \text{ of } 50 \div 25 \times 132 - 2824 + 865$ .

$$\begin{aligned}
 &7829 - 15 \text{ of } 50 \div 25 \times 132 - 2824 + 865 \\
 &= 7829 - 750 \div 25 \times 132 - 2824 + 865 \\
 &= 7829 - 30 \times 132 - 2824 + 865 \\
 &= 7829 - 3960 - 2824 + 865 \\
 &= 7829 + 865 - 3960 - 2824 \\
 &= 8694 - 6784 \\
 &= 1910
 \end{aligned}$$



- ← **1** Do the 'of' operation.
- ← **2** Divide.
- ← **3** Multiply.
- ← **4** Add the '+' numbers and the '-' numbers separately. (Numbers with no sign are also '+' numbers.)
- ← **5** Subtract.

## Brackets

When we want to do a particular operation before others, we put it within brackets. Look how the answer can change when you put an operation within brackets.

$$100 + 50 \div 25 = 100 + 2 = 102$$

$$(100 + 50) \div 25 = 150 \div 25 = 6$$

Here you will learn about two kinds of brackets—( ) and { }.

( ) are called **first brackets, parentheses or round brackets**.

{ } are called **second brackets, braces or curly brackets**.

When there are brackets in a simplification sum, the order in which the operations are to be done is given by **BODMAS**:

- 1 Brackets    2 Of    3 Division    4 Multiplication    5 Addition    6 Subtraction

If there are brackets within brackets, simplify within the inner brackets first.

- Simplify  $180 + 2 \times (100 - 64)$ .

$$\begin{aligned} &180 + 2 \times (100 - 64) \\ &= 180 + 2 \times 36 \\ &= 180 + 72 \\ &= 252 \end{aligned}$$

- ← 1 Simplify within the brackets.
- ← 2 Multiply.
- ← 3 Add.



- Simplify  $3 - \{(38 + 12) \div (98 - 73)\}$ .

$$\begin{aligned} &3 - \{(38 + 12) \div (98 - 73)\} \\ &= 3 - \{50 \div 25\} \\ &= 3 - 2 \\ &= 1 \end{aligned}$$

- ← 1 Simplify within the first brackets.
- ← 2 Divide within the second brackets.
- ← 3 Subtract.



## Exercise 4E

Simplify.

- a.  $4785 \times 27776 \div 248$                       b.  $869 \times 765120 \div 960$                       c.  $2430 \div 81 \times 30$
- a.  $9000 \div 45 \text{ of } 20 + 750 \div 150$                       b.  $4250 \div 125 - 40800 \div 272 + 36 \times 166$
- a.  $4544 \div (70 - 38)$                       b.  $(72 \times 168) \div 21 \text{ of } 16$                       c.  $(24 + 36) \times 64$

4. True or false?

- |  |   |
|--|---|
| a. $75 \times 24 \div 12 = 75 \times (24 \div 12)$ <input type="checkbox"/>        | b. $(12 \times 9) - 7 = 12 \times (9 - 7)$ <input type="checkbox"/>         |
| c. $(115 \times 28) \div 7 = 115 \text{ of } (28 \div 7)$ <input type="checkbox"/> | d. $84 \div (7 \times 12) = (84 \div 7) \times 12$ <input type="checkbox"/> |

5. Simplify

- |   |  |
|---|--|
| a. $\{17 \times (112 - 78)\} \div 289$                | b. $15 \times \{28 - (17 - 12)\}$      |
| c. $(700 \div 10) - \{(12 \times 8) \div (34 - 10)\}$ | d. $61 - \{(35 + 34) \div (46 - 23)\}$ |

# Revision-1

1. Write using Roman numerals.

11	27	36	44	54	65	79	89	91

2. Write using Hindu-Arabic numerals.

XXIX	XLV	LII	LXIV	LXXVI	LXXXIII	XCI	XCIII	XCVIII	XCV

3. Fill in > or < or =.

a. XLI  XCI

b.  $780 \div 13$   LXXV

c. LXII   $31 \times 2$

d. 4,29,04,521  MMM

e. 150,000  1,50,000

f. 72 58 421  7 85 842

4. a. Write in descending order.

LXXII, XXII, LXXXII, XCII, XLII, LXII

\_\_\_\_\_

b. Write in ascending order.

XCII, XL, XXVIII, XLIX, XXXIII, LXX

\_\_\_\_\_

5. Write the answers in Roman numerals.

a.  $IX \times X =$

b.  $XC + IX =$

c.  $8 \times 8 =$

d.  $C - XIX =$

e.  $LXX + XX =$

f.  $7 \times 7 =$

6. Write in figures.

a. Nine lakh nine thousand and ninety-nine

b. Seventy-three thousand and eighty-two

c. Fifty-two crore thirty-seven thousand five hundred and fourteen

d. Four crore seven lakh eleven thousand three hundred and fifty-three

e. Three million four hundred and fifty-four thousand six hundred and twenty-one

f. Six hundred thousand two hundred and seventy-eight

7. Write in the expanded form.

a. 6,72,384 \_\_\_\_\_

b. 74,09,269 \_\_\_\_\_

c. 6,53,74,308 \_\_\_\_\_

8. Rewrite with commas using the Indian system. Then write the number names.

- a. 249318                      b. 72345                      c. 65207008                      d. 3546509                      e. 473983000

9. Rewrite with commas using the international system. Then write the number names.

- a. 205871                      b. 100000                      c. 53812916                      d. 4700800                      e. 600500000

10. Fill in.

- a. In 9 15 42 753, the place value of 9 is \_\_\_\_\_, and that of 1 is \_\_\_\_\_.  
b. In 58 63 290, the place value of 6 is \_\_\_\_\_, and that of 8 is \_\_\_\_\_.  
c. In 6 94 38 555, 6 is in the \_\_\_\_\_ place, and 9 is in the \_\_\_\_\_ place.  
d. In 45 30 892, 5 is in the \_\_\_\_\_ place, and 4 is in the \_\_\_\_\_ place.  
e. In 7 39 456, 3 is in the \_\_\_\_\_ place, and 7 is in the \_\_\_\_\_ place.

11. a. Write in ascending order: 1,26,42,614    20,74,397    48,652    4,88,526    3,92,815

--	--	--	--	--

b. Write in descending order: 2,53,917    2,39,48,721    63,352    1,00,741    2,68,000

--	--	--	--	--

12. Write the greatest and the smallest numbers with the given digits.

- a. 8, 0, 6, 2, 6, 4 and 3                      b. 7, 9, 2, 5, 8 and 1

Do these sums.

13 a.  $1236874 + 2650381 + 727550$                       b.  $4172469 + 6974 + 5154312$                       c.  $14507543 + 22505857$

14 a.  $5237423 - 2238534$                       b.  $67582011 - 3570582$                       c.  $450090 - 97859$

15. a.  $9309 \times 18$                       b.  $25871 \times 123$                       c.  $595352 \times 512$                       d.  $23410 \times 2034$

16. a.  $92677 \div 65$                       b.  $86328 \div 132$                       c.  $2168919 \div 435$                       d.  $2424832 \div 2368$

17. a.  $(36 \times 160) \div 72$  of 5                      b.  $7823 - 128 \div 16$  of 4 - 3973                      c.  $89 - \{(25 \times 39) \div (85 - 70)\}$

18. Rajat bought a car for ₹ 6,34,800 and sold it for ₹ 6,43,400. How much profit did he make?

19. Find the number of seconds in a day.

20. a. Find the smallest 7-digit number that is divisible by 2200.

b. Find the greatest number of 6 digits that is divisible by 156.





How fast can you do long multiplications? Some short cuts developed by Professor Jakow Trachtenberg can make your job easier. Let us see how we can quickly multiply a number by 11 or 12. Remember two things: Start by putting zeros at either end of the number. And, the 'neighbour' of a digit means the digit on its right.

☺ To multiply by 11, add the neighbour.

$$32567 \times 11 = ?$$

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
03256 <u>7</u> 0	03256 <u>7</u> 0	0325 <u>6</u> 70	032 <u>5</u> 670	0 <u>3</u> 25670	0 <u>3</u> 25670
7	37	237	8237	58237	358237
$7 + 0 = 7$	$6 + 7 = 13$ Write 3, carry 1.	$5 + 6 + 1 = 12$ Write 2, carry 1.	$2 + 5 + 1 = 8$	$3 + 2 = 5$	$0 + 3 = 3$

Notice that writing the product of 11 is like doing row addition. So you can write the product quickly as shown.

$$32567 \times 11 \longrightarrow \begin{array}{r} 0325670 \\ 358237 \\ \hline \end{array} \quad \text{Answer: } 358237$$

☺ To multiply by 12, double each digit and add its neighbour.

$$4264 \times 12 = ?$$

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
0426 <u>4</u> 0	0426 <u>4</u> 0	04 <u>2</u> 640	0 <u>4</u> 2640	0 <u>4</u> 2640
8	68	168	1168	51168
$2 \times 4 + 0 = 8$	$2 \times 6 + 4 = 16$ Write 6, carry 1.	$2 \times 2 + 6 + 1 = 11$ Write 1, carry 1.	$2 \times 4 + 2 + 1 = 11$ Write 1, carry 1.	$2 \times 0 + 4 + 1 = 5$

$$4264 \times 12 \longrightarrow \begin{array}{r} 042640 \\ 51168 \\ \hline \end{array} \quad \text{Answer: } 51168$$

1. Use a short cut to multiply each number by 12. Write the product below the number.

- a. 629      b. 4682      c. 36475      d. 271506

2. Use a short cut to multiply each number by 11. Write the product below the number.

- a. 425      b. 7832      c. 95641      d. 121839



# 5. Multiples and Factors

## Multiples

Look at the following products.

$8 \times 1 = 8$

$8 \times 2 = 16$

$8 \times 3 = 24$

$8 \times 4 = 32$

$8 \times 5 = 40$

8, 16, 24, 32 and 40 are the first five **multiples** of 8. Each of them is divisible by 8.

Now look at  $2 \times 2 \times 2 \times 5 = 40$ .

Grouping the factors gives  $2 \times 20 = 40$ ,  $4 \times 10 = 40$  and  $5 \times 8 = 40$ .

So, 40 is a multiple of 2, 5, 8, 10 and 20 (apart from 1 and 30).

And 40 is divisible by each one of them.

- ★ A multiple of a number = the number  $\times$  a counting number.
- ★ A multiple of a number is divisible by the number.



### Properties of Multiples

$6 \times 1 = 6$

$\therefore$  6 is a multiple of 6. And 6 is a multiple of 1.

$13 \times 1 = 13$

$\therefore$  13 is a multiple of 13. And 13 is a multiple of 1.

- ★ A number is a multiple of itself.
- ★ All numbers are multiples of 1.



### Common Multiples

The first 12 multiples of 2: 2 4 6 8 10 12 14 16 18 20 22 24

The first 10 multiples of 3: 3 6 9 12 15 18 21 24 27 30

6, 12, 18 and 24 are multiples of both 2 and 3. They are common multiples of 2 and 3.

There are many other common multiples of 2 and 3 such as 30 and 60.

- Write the first two common multiples of 2, 3, 4 and 6.

Multiples of 2:	2	4	6	8	10	12	14	16	18	20	22	24
Multiples of 3:	3	6	9	12	15	18	21	24	27			
Multiples of 4:	4	8	12	16	20	24	28	32	36	40		
Multiples of 6:	6	12	18	24								

$\therefore$  the first two common multiples of 2, 3, 4 and 6 are 12 and 24.

## Even and Odd Numbers

All the multiples of 2 are called **even numbers**. Or we can say that even numbers are exactly divisible by 2. For example— 2, 4, 6, 10, 222, 456, 998, ..... are even numbers.

The numbers which are not multiples of 2 are called **odd numbers**. Odd numbers are not completely divisible by 2. For example— 1, 3, 5, 9, 11, 13, 411, 513, 871, .... are odd numbers.

**All numbers are either even or odd.**

## Factors

When two numbers are multiplied with each other, each of the numbers is a **factor** of the product.

$$5 \times 9 = 45$$

5 and 9 are factors of 45.

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

5, 3 and 2 are factors of 30.

In other words, a number which divides another number exactly (leaving no remainder at all) is called the factor of the other number.

$$30 \div 1 = 30, \quad 30 \div 2 = 15, \quad 30 \div 3 = 10, \quad 30 \div 5 = 6$$

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

### Properties of Factors

$$8 \times 1 = 8$$

$\therefore$  8 and 1 are factors of 8.

$$19 \times 1 = 19$$

$\therefore$  19 and 1 are factors of 19.

$$320 \times 1 = 320$$

$\therefore$  320 and 1 are factors of 320.

- ★ A number is a factor of itself.
- ★ 1 is a factor of every number.



- Is 12 a factor of 248 and 4272?

$$\begin{array}{r} 20 \\ 12 \overline{) 248} \\ \underline{-24} \phantom{0} \\ 08 \end{array}$$

248  $\div$  12 leaves a remainder:  
 $\therefore$  12 is not a factor of 248.

$$\begin{array}{r} 356 \\ 12 \overline{) 4272} \\ \underline{-36} \phantom{0} \\ 67 \phantom{0} \\ \underline{-60} \phantom{0} \\ 72 \\ \underline{-72} \\ 0 \end{array}$$

4272  $\div$  12 leaves no remainder.  
 $\therefore$  12 is a factor of 4272.

- Find all the factors of 24.

$$2 \times 12 = 24$$

$$3 \times 8 = 24$$

$$4 \times 6 = 24$$

$$5 \times ? = 24 \times$$

$$6 \times 4 = 24$$

$$7 \times ? = 24 \times$$

$$8 \times 3 = 24$$

$$9 \times ? = 24 \times$$

$$10 \times ? = 24 \times$$

$$11 \times ? = 24 \times$$

$$12 \times 2 = 24$$

2 multiplied by numbers greater than 12 give products that are  $>$  24.

$\therefore$  1, 2, 3, 4, 6, 8, 12 and 24 are the only factors of 24.

- ★ 1 and 24 are factors.
- ★ Starting with 2, find which other numbers are factors (or which divide the number fully).





## Exercise 5A

### 1. Fill in the blanks.

- a.  $2 \times 3 \times 5 = 30$ . So, 30 is a multiple of \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ apart from 1 and 30 itself.
- b. The first two common multiples of 2 and 5 are \_\_\_\_\_ and \_\_\_\_\_.
- c.  $55 = 5 \times 11$ , so 5 and 11 are \_\_\_\_\_ of 55.
- d. 7 and 21 are factors of 147. So 147 is \_\_\_\_\_ by 7 and 21.

2. a. Write the first four multiples of 5.
- b. Write the four largest 2-digit multiples of 3.
- c. Write the four smallest 3-digit multiples of 13.
- d. Write the multiples of 11 that are between 100 and 150.


### 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. Write the first two common multiples of: a. 3 and 7                      b. 2, 3 and 4

5. Write the first three common multiples of: a. 5 and 6                      b. 4, 6 and 8

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

a. 7 78

b. 8 125

c. 12 168

d. 16 402

e. 18 643

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

b. 90

c. 140

d. 175

9. Write all the factors of a. 32 and b. 56, other than 1 and the numbers themselves.

10. a. Write the first four 4-digit even numbers.

\_\_\_\_\_

b. Write the even numbers between 88 and 99.

\_\_\_\_\_

c. Write the last five odd numbers that are less than 900.

\_\_\_\_\_

## Prime Numbers

If a number has only two factors, 1 and itself, then the number is said to be a prime number. For example, 2, 3, 5, 7, ..... are prime numbers.

The numbers which only have 1 and the number itself as their factors are known as prime numbers.

The prime numbers from 1 to 100 are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89 and 97.

All prime numbers are odd, except 2.

## Composite Numbers

The numbers which have more than two factors are known as composite numbers. For example, the number 4 has three factors, namely 1, 2 and 4. So, 4 is a composite number. Some more examples of composite numbers are 6, 8, 9, 10, 12, 14, 15, 16, 18 and so on.

The numbers which have more than two factors are known as composite numbers.

1 is neither a prime nor a composite number.

## Twin Primes Numbers

Two prime numbers that differ by 2 called twin primes.



For example, 3 and 5, 5 and 7, 11 and 13 are twin primes.

## Coprime Numbers

Consider any two numbers and write their factors. Also, find out their common factors. If their common factor is only 1, then such numbers are said to be **coprime numbers**.

For example, factors of 6 : 1, 2, 3, 6

factors of 35 : 1, 5, 7, 35

The common factor of 6 and 35 is 1

If the common factor of two given numbers is 1, then such numbers are called coprime numbers.

Coprime numbers need not be prime numbers.

- Check whether the following numbers are coprimes: (a) 15 and 25 (b) 49 and 250.

(a)  $15 = 3 \times 5$

$25 = 5 \times 5$

(b)  $49 = 7 \times 7$   $250 = 2 \times 5 \times 5 \times 5$

As 5 is a common factor (other than 1), 15 and 25 are not coprime numbers.

As 49 and 250 have no common factor other than 1, they are coprime numbers.

## Prime Factorization

Every composite number can be expressed as the product of its factors. When all the factors are prime, it is called **prime factorisation**.

For example, the prime factorization of  $24 = 2 \times 2 \times 2 \times 3$ .

You can do prime factorization by two methods.

1. Repeatedly break down factors into smaller factors till all the factors are primes.
2. Repeatedly divide the number by prime numbers till the quotient is 1.

You can also show the factorization by a factor tree.

- Write the prime factorization of 210. (Factorize 210.)

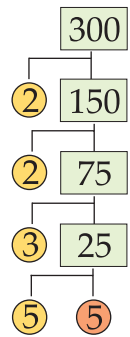
$$\begin{aligned} 210 &= 2 \times 105 \\ &= 2 \times 3 \times 35 \\ &= 2 \times 3 \times 5 \times 7 \\ \therefore 210 &= 2 \times 3 \times 5 \times 7. \end{aligned}$$

- Factorize 300.

$$\begin{array}{r|l} 2 & 300 \\ 2 & 150 \\ 3 & 75 \\ 5 & 25 \\ 5 & 5 \\ & 1 \end{array}$$

$\therefore 300 = 2 \times 2 \times 3 \times 5 \times 5.$

Prime factorization can be shown by a factor tree like the one on the right.



- Find the common factors of 8 and 12.

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

$\therefore 8 = 2 \times 2 \times 2.$

Grouping the factors, we get  $4 \times 2 = 8$ .  
So the factors of 8 are 1, 2, 4 and 8.

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

$\therefore 12 = 2 \times 2 \times 3.$

Grouping the factors,  $4 \times 3 = 12$  and  $2 \times 6 = 12$ .  
So the factors of 12 are 1, 2, 3, 4, 6 and 12.

$\therefore$  the common factors of 8 and 12 are 2 and 4, other than 1.



### Exercise 5B

1. Pick the prime numbers.

a. 3 47 53 63

b. 7 13 29 50

c. 2 5 19 1

2. Pick the composite numbers.

a. 17 94 88 11

b. 39 93 41 675

c. 0 25 18 19

3. a. Write the first ten composite numbers greater than 31.  
 b. Write the first six prime numbers greater than 20.

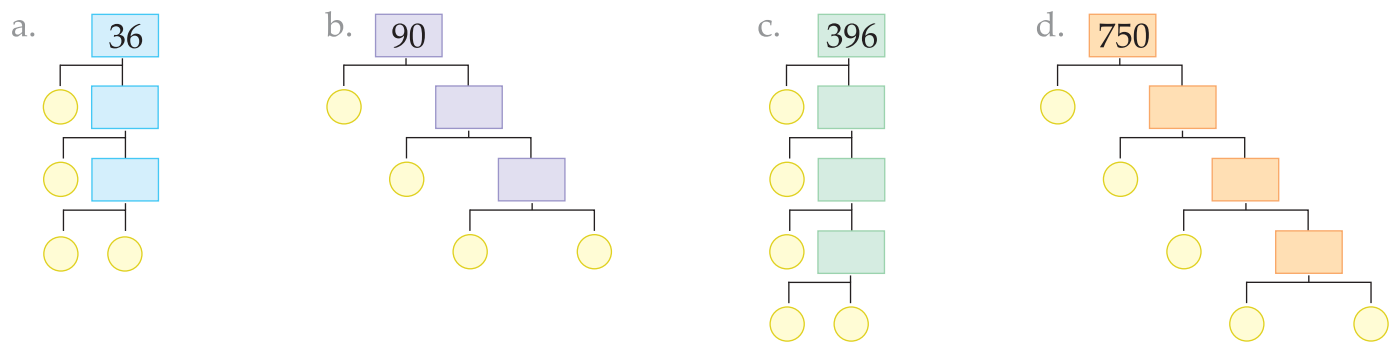
4. Are the following pairs of numbers coprime numbers?

- a. 35, 99      b. 25, 36      c. 83, 120      d. 75, 57

5. Write the prime factorization of the following numbers.

- a. 64      b. 112      c. 125      d. 1,575      e. 3,528

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. 45   75      b. 12   18      c. 42   308      d. 30   105

## Tests of Divisibility

A number is said to be divisible by the numbers that divide it without leaving a remainder. Divisibility test help us check quickly whether a number is divisible by a given number or not.

### Divisibility by 2

★ A number is divisible by 2 if it is even.

You can say that 12, 84, 506, 5 278 and 57 590 are divisible by 2 because they are even.

### Divisibility by 10

★ Numbers that end in 0 are divisible by 10.

For example, 50, 330, 4 090 and 87 300 are divisible by 10.

### Divisibility by 5

★ Numbers that end in 0 or 5 are divisible by 5.

For example, 35, 170, 29 095 and 4 32 580 are divisible by 5.

## Divisibility by 3

★ A number is divisible by 3 if the sum of its digits is divisible by 3.

The sum of the digits of 873 is  $8 + 7 + 3 = 18$ . As 18 is divisible by 3, 873 is divisible by 3.

The sum of the digits of 431 is  $4 + 3 + 1 = 8$ . 8 is not divisible by 3. So, 431 is not divisible by 3.

## Divisibility by 9

★ A number is divisible by 9 if the sum of its digits is divisible by 9.

For 1872:  $1 + 8 + 7 + 2 = 18$ . As 18 is divisible by 9, 1872 is divisible by 9.

For 99127:  $9 + 9 + 1 + 2 + 7 = 28$ . As 28 is not divisible by 9, 99127 is not divisible by 9.

Tests for 3 & 9 are similar.



## Divisibility by 4

★ A number is divisible by 4 if the number formed by its last two digits is divisible by 4.

The number formed by the last two digits of 7316 is 16. 16 is divisible by 4. So is 7316.

4846 is not divisible by 4 because 46 is not divisible by 4.

## Divisibility by 8

★ A number is divisible by 8 if the number formed by its last three digits is divisible by 8.

The number formed by the last three digits of 19824 is 824.

By dividing we find that 824 is divisible by 8. So, 19824 is divisible by 8.

6342 is not divisible by 8 because 342 is not divisible by 8.

Tests for 4 & 8 are similar.



## Divisibility by 6, 12 and 15

★ A number is divisible by 6 if it is divisible by 2 as well as 3.

★ A number is divisible by 12 if it is divisible by 3 as well as 4.

★ A number is divisible by 15 if it is divisible by 3 as well as 5.

$$\begin{aligned}6 &= 2 \times 3 \\12 &= 3 \times 4 \\15 &= 3 \times 5\end{aligned}$$

Tests for 14 = 2 × 7  
18 = 2 × 9  
22 = 2 × 11  
are similar.



Let us test 3360 for divisibility by 6, 12 and 15.

**Is 3360 divisible by 6?** As 3360 is even, it is divisible by 2. The sum of its digits =  $3 + 3 + 6 + 0 = 12$ , which is divisible by 3. So, 3360 is divisible by 3 also. Therefore, it is divisible by 6.

**Is 3360 divisible by 12?** We found that 3360 is divisible by 3. The number formed by its last two digits is 60, which is divisible by 4. As 3360 is divisible by both 3 and 4, it is divisible by 12.

**Is 3360 divisible by 15?** As 3360 ends in 0, it is divisible by 5. And we already know that 3360 is divisible by 3. As 3360 is divisible by both 3 and 5, it is divisible by 15.



## Divisibility by 11

- ★ 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.

**Is 737 divisible by 11?** The sums of the digits in the odd and even places are  $7 + 7 = 14$  and 3, respectively. Their difference =  $14 - 3 = 11$ , which is divisible by 11. So, 737 is divisible by 11.

**Is 13 244 divisible by 11?** The sum of the digits in the odd places =  $4 + 2 + 1 = 7$ .

The sum of the digits in the even places =  $4 + 3 = 7$ .

Their difference =  $7 - 7 = 0$ , which is divisible by 11. So, 13 244 is divisible by 11.

## Divisibility by 7

- ★ Find the difference between the double the last digit and the rest of the number.

If the difference is divisible by 7, the number is divisible by 7.

(You may have to use this short cut a number of times to arrive at a small number.)

**Is 434 divisible by 7?** Double the last digit is 8. The rest of the number is 43. Their difference is  $43 - 8 = 35$ , which is divisible by 7. So, 434 is divisible by 7.

**Is 1 792 divisible by 7?** Double the last digit is 4. The rest of the number is 179.

Their difference is  $179 - 4 = 175$ . Is 175 divisible by 7? Double the last digits is 10. The rest of the number is 17. Their difference =  $17 - 10 = 7$ , which is divisible by 7. So, 175 is divisible by 7, which makes 1 792 divisible by 7.

- Test 1 836 and 57 654 for divisibility by 4, 9 and 6.

1836: The number formed by the last two digits is 36, which is divisible by 4. So, 1836 is divisible by 4.

The sum of its digits =  $1 + 8 + 3 + 6 = 18$ , which is divisible by 9. So, 1836 is divisible by 9.

The sum of its digits is 18, which is divisible by 3. Also, being an even number, 1836 is divisible by 2. As 1836 is divisible by both 2 and 3, it is divisible by 6.

57654: The last two digits make 54, which is not divisible by 4. So, 57654 is not divisible by 4.

The sum of its digits =  $5 + 7 + 6 + 5 + 4 = 27$ , which is divisible by 9. So, 57654 is divisible by 9.

The sum of its digits is 27, which is divisible by 3. So 57654 is divisible by 3. And it is an even number, which makes it divisible by 2. As it is divisible by both 2 and 3, it is divisible by 6.

- Write in the circle the smallest digit that makes the number divisible by the one in the square:

a.  72  Numbers ending in 5 or 0 are divisible by 5. So, the required smallest digit is 0.

b.  2  6 The number formed by the last two digits has to be divisible by 4. The smallest number ending in 6 that is divisible by 4 is 16. So the required digit is 1.

c.  430  To be divisible by 9, the sum of digits has to be divisible by 9. We have  $4 + 3 + 0 + 2 = 9$ .





## Exercise 5C

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. 117, 423, 1 287, 4 736

b. 891, 769, 3 141, 1 035

c. 666, 949, 8 685, 25 506

In each of the following find the numbers that are divisible by the first number.

3. a. (4) 232, 1 394, 5 056, 21 602

b. (4) 5502, 7 508, 5 616, 112 848

4. a. (6) 86, 564, 1 848, 52 668

b. (12) 184, 1 464, 3 480, 45 680

c. (15) 75, 415, 1 380, 74 335

d. (18) 252, 3 930, 8 280, 93 834

5. Which of the following numbers are divisible by 11?

a. 289, 605, 234, 93 808

b. 191, 326, 814, 67 441

c. 178, 847, 1 234, 91 718

6. Which of the following numbers are divisible by 7?

a. 97, 605, 301, 2 135

b. 133, 504, 644, 5 439

c. 91, 452, 247, 3 248

7. a. Which of these numbers are divisible by 2 but not by 6?

234, 7 016, 25 314

b. Which of these numbers are divisible by 4 but not by 8?

644, 3 216, 55 100

8. Fill in the greatest digit to make the number divisible by 3.

a. 45

b. 680

c. 57  69

d. 7  994

9. Fill in the smallest digit to make the number divisible by 4.

a. 51

b. 523

c. 214  2

d. 75  48

## 6. HCF and LCM

### Highest Common Factor (HCF)

Look at the following factorizations.

$$15 = 3 \times 5$$

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

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

The common factors of 1, 3, 5 and 15.

The greatest, or highest, among the common factors is 15.

It is the greatest number that divides both 15 and 30 exactly (without a remainder.)

We say that the **highest common factor (HCF)** of 15 and 30 is 15.

We also say that 15 is the **greatest common divisor (GCD)** of 15 and 30.

The HCF (or GCD) of two or more numbers is the largest number which divides the given numbers without leaving a remainder.



### Finding HCF with the Help of Multiplication Tables (HCF by Inspection)

★ Find the HCF of 8 and 16 with the help of multiplication tables.

We find 8 and 16 together in the multiplication tables of 2, 4 and 8.

Among these, 8 is the largest number.

∴ the HCF of 8 and 16 is 8.

★ Find the HCF of 25 and 18 by inspection.

We do not find 25 and 18 together in any multiplication table.

So, the greatest number by which both 25 and 18 are divisible is 1.

∴ the HCF of 25 and 18 is 1.

★ Find the HCF of 9 and 27 with the help of multiplication tables.

We find both 9 and 27 with the help of multiplication tables of 3 and 9.

Between 3 and 9, 9 is greater.

∴ the HCF of 9 and 27 is 9.

(The greatest number by which both 9 and 27 are divisible is 9.)

★ Find the HCF of 21 and 56 by inspection.

We find both 21 and 56 only in the multiplication table of 7.

∴ the HCF of 21 and 56 is 7.

- 1 Find a table that has the smaller number.
- 2 Is the larger number in that table too?
- 3 If not, check another table.



## Finding HCF by Finding Factors

- Find the HCF of 12 and 18 by finding factors.

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

$$\therefore 12 = 2 \times 2 \times 3.$$

Grouping the factors, we get

$$4 \times 3 = 12, \quad 2 \times 6 = 12.$$

So the factors of 12 are 1, 2, 3, 4, 6 and 12.

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

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

Grouping the factors, we get

$$2 \times 9 = 18, \quad 6 \times 3 = 18.$$

So the factors of 18 are 1, 2, 3, 6, 9 and 18.

$\therefore$  the common factors of 12 and 18 are 1, 2, 3 and 6.

The highest common factor (HCF) is 6.

We can also get the HCF by multiplying the common prime factors of 12 and 18. The common prime factors of 12 and 18 are 2 and 3.  $\text{HCF} = 2 \times 3 = 6$ . This method is the most common.



## Finding HCF by Prime Factorization

- Find the HCF of 12 and 18 by prime factorization.

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

$$\therefore 12 = 2 \times \textcircled{2} \times \textcircled{3}$$

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

$$\therefore 18 = \textcircled{2} \times \textcircled{3} \times 3$$

The common prime factors are 2 and 3.

$$\therefore \text{HCF} = 2 \times 3 = 6.$$

- Find the HCF of 10, 30 and 45 by prime factorization.

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

$$\therefore 10 = 2 \times \textcircled{5}$$

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

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

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

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

The common prime factors is 5.

$$\therefore \text{HCF} = 5.$$

- Find the HCF of 108, 136 and 152.

$$\begin{array}{r|l} 2 & 108 \\ \hline 2 & 54 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 136 \\ \hline 2 & 68 \\ \hline 2 & 34 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 152 \\ \hline 2 & 76 \\ \hline 2 & 38 \\ \hline 19 & 19 \\ \hline & 1 \end{array}$$

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

$$136 = \textcircled{2} \times \textcircled{2} \times 2 \times 17$$

$$152 = \textcircled{2} \times \textcircled{2} \times 2 \times 19$$

The common prime factors are 2, 2.

$$\therefore \text{HCF} = 2 \times 2 = 4.$$



### Exercise 6A

Find the HCF of the numbers with the help of multiplication tables (by inspection).

- a. 8 and 16                      b. 9 and 16                      c. 20 and 28                      d. 54 and 81
- a. 42, 84                          b. 36, 63                          c. 25, 90                          d. 24, 33
- a. 13 and 27                      b. 15 and 28                      c. 11 and 16                      d. 112 and 120

4. Find the HCF of the numbers by finding factors.

- 10, 15                      b. 6, 9                      c. 30, 45                      d. 72, 90                      e. 20, 32

Find the HCF of the numbers by prime factorization.

- a. 36 and 81                      b. 30 and 75                      c. 56 and 84                      d. 64 and 80
- a. 48 and 128                      b. 45 and 105                      c. 66 and 198                      d. 72 and 126
- a. 120 and 168                      b. 130 and 208                      c. 165 and 275                      d. 240 and 300
- a. 38, 57 and 76                      b. 36, 48 and 84                      c. 63, 81 and 108                      d. 54, 72 and 90  
 e. 130, 195 and 390                      f. 120, 128 and 496                      g. 132, 154 and 176                      h. 210, 240 and 360



Some More Sums  
for Practice

Find the HCF.

- a. 42, 140                      b. 39, 93                      c. 385, 490
- a. 60, 270 and 390                      b. 75, 150 and 225                      c. 36, 420 and 900

## Word Problems

- Find the greatest number that will divide 18 and 24 without leaving a remainder.

The greatest number that will divide 24 and 56 exactly is their greatest common divisor, or HCF.

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

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

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

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

The required HCF is  $2 \times 3 = 6$ . So, 6 is the greatest number that will divide 18 and 24 exactly.

- Find the greatest number that divides 149 and 101, leaving 5 as remainder in each case.

149 divided by the number leaves 5 as remainder. So, the number divides  $149 - 5 = 144$  exactly.

101 divided by the number leaves 5 as remainder. So, the number divides  $101 - 5 = 96$  exactly.

The greatest number that will divide 30 and 45 exactly is their HCF.

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

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

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

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

The HCF of 144 and 96 is  $2 \times 2 \times 2 \times 2 \times 3 = 48$ . So, the required number is 48.

- Find the greatest number that divides 13, 26 and 39, leaving the remainder 1, 2 and 3 respectively.

13 divided by the number leaves 1 as remainder. So, the number divides  $13 - 1 = 12$  fully.

26 divided by the number leaves 2 as remainder. So, the number divides  $26 - 2 = 24$  fully.

39 divided by the number leaves 3 as remainder. So, the number divides  $39 - 3 = 36$  fully.

The greatest number that will divide 12, 24 and 36 fully is their HCF.

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

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

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

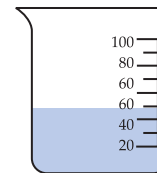
$$\therefore 24 = 2 \times 2 \times 2 \times 3$$

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

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

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

- What can be the greatest capacity of a measuring cup that can be filled a number of times to measure out 20 ml and 30 ml?



The required capacity (number) will have to divide 20 and 30 exactly.

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

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

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

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

The HCF of 20 and 30 is  $2 \times 5 = 10$ . So, the greatest capacity the cup can have is 10 ml.



### Exercise 6B

- Find the greatest number that will divide 27 and 33 without leaving a remainder.
  - Find the greatest number that will divide 48, 60 and 64 exactly.
- Find the greatest number that divides 51 and 79 with 9 as remainder in both cases.
  - Find the greatest number that divides 33 and 45, leaving 3 as remainder in each case.
- Find the biggest number that divides 49, 79 and 91, leaving the remainder 7 in each case.
- Find the greatest number that divides 57, 133 and 384, leaving 7, 8 and 9 respectively as remainder.
  - Find the greatest number that divides 27, 41 and 50, leaving 3, 5 and 2 respectively as remainder.
- Find the greatest possible length of a wire which can be used to measure exactly two wires of length 18 m and 24 m, respectively.
- There are three drums containing 42ℓ, 70ℓ and 90ℓ of water. Find the capacity of the largest container that can be used to measure water in the three drums by the exact number of time.





## Do and Digest

**Aim** To find out about LCM

**Things needed** A sheet of paper, squared paper, colour pencils, scissors, counters

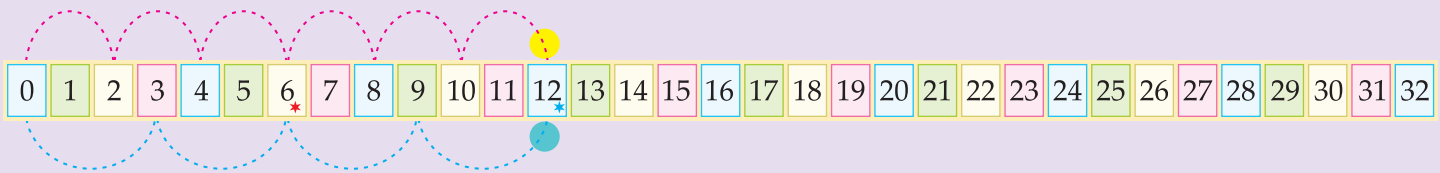
**Do and Learn**

(A)

1. Make a number strip like the one shown below. You can make the strip much longer.



2. Place two counters at 0. Ask your friend to choose a number. Suppose he chooses 2. You choose a different number, say, 3. Starting from 0, your friend moves his counter in jumps (multiples) of 2. You move yours in jumps of 3. Note down the numbers at which the counters meet.



4. Your friend's counter will jump in multiples of 2:  $0 \rightarrow 2 \rightarrow 4 \rightarrow 6 \rightarrow 8 \rightarrow 10 \rightarrow 12, \rightarrow \dots$   
Your counter will jump in multiples of 3:  $0 \rightarrow 3 \rightarrow 6 \rightarrow 9 \rightarrow 12, \rightarrow \dots$
5. Note that the counters meet at numbers that are common multiples of 2 and 3. The smallest, or lowest, of the common multiples is 6. It is called the **lowest common multiple (LCM)**.
6. After you note down a few meeting points of the counters, you will notice that they increase by 6, that is, by the lowest common multiple (LCM). So, if the counters are at 24, you can predict that they will meet again after another 6, at 30. Try this out with other set of numbers like 3 and 4.

(B)

1. Use squared paper to make strips that have different number of boxes, say, 3 and 4. Make multiple copies of each kind of strip.
2. Place two different kinds of strip in two rows, as shown.

The number of boxes increase in multiples of 3 in one row and in multiples of 4 in the other.

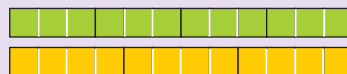


After how many boxes in a row do the lengths of the strips match?

Their lengths will match first after 12 boxes, then after 24 boxes, and so on.

Notice that 12 is the first and the lowest common multiples of 3 and 4.

This means that the lengths of the strips match after every 12 boxes.





# Answers to Selected Exercises

## EXERCISE - 1A

- V, VII, IX, X, XII, XVII, XXXVI, XLIII, XLVIII, L
- (a) > (b) < (c) = (d) >
- (a) 19,999 (b) 1,08,999 (c) 61,999 (d) 75,499  
(e) 4,84,999
- (a) 30000, 700, 6000 respectively  
(b) 20000, 3000, 400 respectively  
(c) 600000, 80, 3000 respectively  
(d) 800000, 20000, 600 respectively  
(e) 2000000, 500000, 60000 respectively
- (a) 901741 (b) 813088 (c) 304997 (d) 433828  
(e) 739493 (f) 403011
- (a) 
$$\begin{array}{r} 452783 \\ + 393736 \\ \hline 846519 \end{array}$$
  
(b) 
$$\begin{array}{r} 360923 \\ - 234444 \\ \hline 126479 \end{array}$$
  
(c) 
$$\begin{array}{r} 67120 \\ - 24313 \\ \hline 42807 \end{array}$$
  
(d) 
$$\begin{array}{r} 23456 \\ + 13452 \\ \hline 36908 \end{array}$$
- (a) 0 (b) 8500 (c) 12600 (d) 36000
- (a) 51 (b) 9 (c) 70 (d) 30
- (a) multiple (b) divisible (c) factors (d) 18, 900, 32324  
(e) 45, 4831 (f) 13, 23 (g) 34, 39 (h) 36, 54 (i) 2, 4, 7 (j) 2
- (a) 540 (b) 702 (c) 3749 (d) 14552  
(e) 2856122
- (a) Q=40, R=2 (b) Q=14, R=0 (c) Q=102, R=0  
(d) Q=308, R=0 (e) Q=140, R=25
- (a) 583 (b) 652
- (a) 12, 24 (b) 10, 20
- 341—divisible by none 94—divisible by 2,  
960—Divisible by 2, 3, 5, 10 1281—divisible by 3
- (a) 288, 294 (b) 9995
- (a) 2, 3, 11 (b) 2
- (a) 45992 (b) 45696 (c) 540 (d) 98  
(e) 1172 (f) 10010 (g) ₹ 2100

## EXERCISE - 1B

- (a) 6, 45, 30 (b) improper, mixed  
(c)  $7\frac{3}{8}$  (d)  $\frac{5}{11}, \frac{7}{11}, \frac{9}{11}$   
(e) 12, 49, 84, 75 respectively (f) True  
(g) True (h)  $\frac{2}{3}, \frac{3}{4}$  respectively (i)  $60, \frac{7}{10}, \frac{5}{100}, \frac{4}{1000}$   
(j)  $7 + \frac{2}{10} + \frac{8}{100} + \frac{4}{1000}$  (k) 375.85
- (a)  $3\frac{2}{3}, 5\frac{4}{10}$  (b)  $\frac{30}{7}, \frac{59}{8}$   
(c)  $\frac{10}{15}, \frac{9}{15}$  (d) .023, 6.3
- (a) > (b) < (c) = (d) < (e) >
- (a) > (b) > (c) = (d) < (e) >
- (a)  $\frac{4}{7}, \frac{4}{9}, \frac{4}{11}, \frac{4}{15}, \frac{4}{17}$  (b)  $\frac{10}{11}, \frac{8}{11}, \frac{7}{11}, \frac{5}{11}, \frac{3}{11}$
- (a) 2.005, 2.05, 2.051, 2.5, 2.501  
(b) 0.101, .102, .110, 1.02, 1.021
- (a)  $\frac{1}{9}$  (b)  $\frac{3}{5}$  (c)  $\frac{6}{17}$  (d) 9.83 (e) 65.552
- (a) ₹ 280 (b)  $\frac{4}{7}$  (c) 6

## EXERCISE - 1C

- (a) 2 (b) 2 (c) 20 (d) 5000 (e) 6  
(f) 8 (g) 12 (h) 6 (i) 35 (j) 52
- (a) 310 min (b) 55 h (c) 111 days  
(d) 8 min 20 s (e) 1 h 45 min (f) 2 day 7 hours
- (a) False (b) True (c) True (d) False (e) True  
(f) True (g) True (h) False
- (a) 45 cm 6 mm (b) 141 m 33 cm  
(c) 24 km 140 m (d) 509 m 33 cm

- (a) 100 kg 625 g (b) 202 l 603 ml (c) 180 kg 800 g
- (a) 4 cm 2 mm (b) 35 cm (c) 199 km 591 m  
(d) 15 kg 555 g (e) 54 l 207 ml
- (a) 878 m 50 cm (b) 113 cm 4 mm (c) 365 l 170 ml  
(d) 208 km 278 m (e) 929 kg 24 g
- (a) 31 l 55 ml (b) 40 kg 550 g (c) 9 km 61 m  
(d) 30 m 41 cm (e) 50 cm 1 mm

## EXERCISE - 1D

- (a) quadrilateral (b) polygon (c) length  
(d) radius (e) radius (f) chord
- (a) 20 cm, 21 square cm (b) 72 m, 288 square m
- (a) 32 mm, 64 square mm (b) 60 cm, 225 square cm
- (a) 540 square m
- (a) 39 (b) strawberry (c) Orange, 6

## EXERCISE - 2A

- (a) 12, 17, 27, 34, 42, 49, 31, 45, 46, 50 respectively  
(b) 52, 55, 59, 62, 64, 69, 72, 74, 79, 80 respectively  
(c) 82, 84, 85, 87, 89, 90, 91, 94, 99, 100 respectively
- (a) XV, XVIII, XXVII, XXXVIII, XXVI, XXXII, XLI, XLV,  
XLVIII respectively  
(b) LI, LIII, LVI, LIX, LXI, LXIV, LXVIII, LXXII, LXXXIV respectively  
(c) LXXVI, LXXVIII, LXXX, LXXXII, LXXXIII, LXXXV, XC, XCIX, C
- (a) > (b) > (c) < (d) < (e) >  
(f) > (g) < (h) > (i) <
- (a) = (b) < (c) < (d) < (e) = (f) >
- (a) XLIX, LXVII, LXXXIX, XC, XCII, XCV  
(b) XXX, XXXVII, XL, LX, LXIX, LXX
- (a) XCVII, LXXXVIII, LXVI, LIX, LIV, XX  
(b) XCIX, LXI, LIX, XXIX, XXI, XV
- (a) LXXXVIII (b) XL (c) XLIX (d) C  
(e) LXXXIX (f) LI (g) L (h) LXIII

## EXERCISE - 3A

- (a) 76,543 (b) 8,64,241 (c) 34,26,428  
(d) 5,14,86,114 (e) 13,20,42,057 (f) 8,74,05,236  
(g) 20,61,745
- (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  
(e) 400000000+40000000+6000000+800000+0+0+200+0+1  
(f) 700000000+60000000+0+800000+0+8000+200+40+5  
(g) 5000000+100000+10000+5000+600+10+8

- (a) 

TC	C	TL	L	TTh	Th	H	T	O
				4	0	6	2	4

  
(b) 

TC	C	TL	L	TTh	Th	H	T	O
			3	4	1	2	6	6

  
(c) 

TC	C	TL	L	TTh	Th	H	T	O
		8	4	7	6	5	9	0

  
(d) 

TC	C	TL	L	TTh	Th	H	T	O
	2	5	0	6	0	4	3	3

  
(e) 

TC	C	TL	L	TTh	Th	H	T	O
1	9	8	2	0	3	1	5	5
- (a) 

HB	Tb	B	HM	TM	M	HTh	TTh	Th	H	T	O
						2	4	3	0	0	0

  
(b) 

HB	Tb	B	HM	TM	M	HTh	TTh	Th	H	T	O
						6	0	0	2	2	2

  
(c) 

HB	Tb	B	HM	TM	M	HTh	TTh	Th	H	T	O
					5	2	0	0	9	1	6



	HB	Tb	B	HM	TM	M	HTh	TTh	Th	H	T	O
(d)				9	1		5	0	2	6	0	8
(e)			8	0	7	5	0	0	0	0	0	0

5. (a) 4,38,262 (b) 63,04,837 (c) 2,08,34,104 (d) 86,00,86,300  
 (e) 321,541 (f) 1,073,666 (g) 72,418,202 (h) 5,008,040,281

6. (a) Forty-eight thousand seven hundred and thirty-two  
 (b) Fifty thousand and fifty  
 (c) Three lakh fifty-three thousand six hundred and twenty-seven  
 (d) Six lakh three thousand two hundred and fifteen  
 (e) Thirty-nine lakh thirty-two thousand  
 (f) Eighty-four lakh thirty thousand three hundred and forty-seven  
 (g) Six crore eighty-three lakh forty-six thousand five hundred and eighty-two  
 (h) Five crore thirty-eight lakh four thousand  
 (i) Thirty-six crore twenty lakh forty thousand eight hundred and sixty-one  
 (j) Four crore six lakh seven thousand and eighty
7. (a) three hundred twenty-six thousand eight hundred and thirty-one  
 (b) Six hundred one thousand two hundred and seventy-five  
 (c) Six million four hundred thirty-six thousand nine hundred and fifty-five  
 (d) Nine million seventy-five thousand three hundred  
 (e) Forty-seven million six hundred thousand  
 (f) Eight million four hundred thirty thousand three hundred and forty-seven  
 (g) Sixty-eight million three hundred forty-six thousand five hundred and eighty-two  
 (h) Three hundred eighty-four million two hundred seventy-one thousand and fourteen  
 (i) Three billion sixty million seventy thousand  
 (j) Five billion one hundred sixty-four million three hundred thirty-four thousand one hundred and thirty-eight
8. (a) 6,23,467 and 623,467 (b) 5,43,468 and 543,468  
 (c) 24,65,704 and 2,46,5,704 (d) 46,47,480 and 4,64,7,480  
 (e) 40,74,023 and 4,074,023 (f) 3,36,82,792 and 33,682,792  
 (g) 6,66,666 and 666,666 (h) 3,28,00,623 and 32,800,623  
 (i) 28,62,37,428 and 286,237,428 (j) 65,00,02,035 and 650,002,035
9. (a) 68,587 68,588 68,589 68,590  
 (b) 2,38,888 2,38,889 2,38,890 2,38,891  
 (c) 18,62,389 18,62,390 18,62,391 18,62,392  
 (d) 6,73,00,603 6,73,00,604 6,73,00,605 6,73,00,606  
 (e) 55,02,84,001 55,02,84,002 55,02,84,003 55,02,84,004

10. (a) 75,999 (b) 2,51,999 (c) 4,80,101 (d) 71,29,999  
 (e) 6,35,18,211 (f) 22,34,82,078
11. (a) 38,001 (b) 57,090 (c) 7,30,000 (d) 46,52,705  
 (e) 5,10,00,000 (f) 27,00,04,010

### EXERCISE - 3B

1. (a) lakhs, thousands (b) ten lakhs, ten thousands  
 (c) crores, lakhs (d) 5, 500000  
 (e) 8, 8000000 (f) 7, 5  
 (g) 2000000, 80000 (h) 70000000, 5000
2. (a) 40000, 1000, 800, 3 (b) 2, 900, 7000, 40000  
 (c) 300000, 70000, 4000, 500  
 (d) 3000, 700000, 40000, 50  
 (e) 1000, 5000000, 200000, 30000  
 (f) 7000000, 600000, 2000, 80000  
 (g) 700, 6000000, 2, 0  
 (h) 30000000, 2000000, 600000, 80000  
 (i) 100000000, 40000000, 3000000, 200000  
 (j) 200000000, 80000000, 300000, 70000
3. (a) > (b) = (c) < (d) < (e) < (f) >  
 (g) = (h) < (i) = (j) < (k) < (l) <
4. (a) 6 72 841 76 85 126 (b) 99,999 4,67,823  
 (c) 300,000 30,000,000 (d) 22,222 22,22,22,222  
 (e) 52 63 748 52 63 74 859

5. (a) 75,00,000 25,77,889 5,63,409 59,741 25,632  
 (b) 82,567 73,642 72,897 35,227 28,493  
 (c) 780 900 649 700 643 826 642 589 439 571  
 (d) 2,65,49,000 1,50,45,369 1,45,28,302 1,23,36,408 21,72,603  
 (e) 9540378 9540002 9504020 959784 950420
6. (a) 71,421 8,16,324 9,75,342 56,64,248 89,10,123  
 (b) 5520 63825 742503 8420369 9316224  
 (c) 612182 1224360 2450071 4816203 91827364  
 (d) 51545135 55139000 91836643 100000000 344556941  
 (e) 2,18,14,121 3,27,18,396 3,61,22,481 4,36,00,000 5,45,00,000
7. (a) 754321 123458 (b) 7654310 1034567  
 (c) 9864200 2004689 (d) 98765433 33456789  
 (e) 87765410 10456778

### EXERCISE - 4A

1. (a) 81304548 (b) 190069032 (c) 418430300  
 (d) 40234517 (e) 436133100 (f) 183802393
2. (a) 6700501 (b) 26852498 (c) 82044340
3. (a) 4782319 (b) 18395686 (c) 13659782
4. (a) 7465165 (b) 1660216 (c) 5294312
5. (a) 
$$\begin{array}{r} 1\ 5\ 4\ 1\ 1\ 3 \\ +\ 3\ 5\ 3\ 6\ 3 \\ +\ 2\ 4\ 6\ 5\ 5\ 2 \\ \hline 4\ 3\ 6\ 0\ 2\ 8 \end{array}$$
 (b) 
$$\begin{array}{r} 2\ 2\ 6\ 0\ 6\ 6\ 5 \\ +\ 3\ 7\ 2\ 5\ 5\ 4\ 3 \\ +\ 3\ 0\ 4\ 2\ 9\ 3 \\ \hline 6\ 2\ 9\ 0\ 5\ 0\ 1 \end{array}$$
 (c) 
$$\begin{array}{r} 8\ 1\ 6\ 7\ 2\ 8\ 4\ 2 \\ +\ 8\ 4\ 0\ 4\ 3\ 5\ 6 \\ +\ 4\ 7\ 5\ 2\ 2\ 5\ 3 \\ \hline 9\ 4\ 8\ 2\ 9\ 4\ 5\ 1 \end{array}$$
6. (a) 
$$\begin{array}{r} 3\ 5\ 6\ 0\ 8\ 2 \\ -\ 2\ 4\ 5\ 5\ 1\ 7 \\ \hline 1\ 1\ 0\ 5\ 6\ 5 \end{array}$$
 (b) 
$$\begin{array}{r} 5\ 3\ 4\ 0\ 5\ 1\ 0 \\ -\ 2\ 3\ 2\ 6\ 7\ 1\ 4 \\ \hline 3\ 0\ 1\ 3\ 7\ 9\ 6 \end{array}$$
 (c) 
$$\begin{array}{r} 6\ 0\ 0\ 0\ 0\ 0\ 0 \\ -\ 3\ 6\ 4\ 4\ 2\ 5\ 1\ 4 \\ \hline 2\ 3\ 5\ 5\ 7\ 4\ 8\ 6 \end{array}$$
7. (a) 19353130 (b) 375343  
 (c) 248995 (d) 11416845
8. (a) 14644209 (b) 89230576 (c) 13819232  
 (d) 60705846 (e) 209075000
9. (a) 2379466 (b) 160896 (c) 5589951  
 (d) 29848787 (e) 44521795
10. (a) 91141 (b) 63188428

### EXERCISE - 4B

1. 15,80,480 2. (a) 5,94,22,000 (b) 37,640 3. 4,23,503 4. 47,90,735  
 5. 5,29,134 6. 7440725 are females 7. ₹ 5,99,320 8. ₹ 29,17,210  
 9. 2,70,57,082 10. Gain; ₹ 17,30,500 11. Loss; ₹ 2,89,782

### EXERCISE - 4C

1. (a) 6788410 (b) 32070675 (c) 16566927  
 2. (a) 699552 (b) 5084928 (c) 14469290  
 3. (a) 2259405 (b) 2249170 (c) 16432740  
 4. (a) 4017674 (b) 7329792 (c) 39316776  
 5. (a) 5177790 (b) 8790000 (c) 5616000
6. (a) Q=78, R=0 (b) Q=87, R=5 (c) Q=243, R=0  
 7. (a) Q=223, R=4 (b) Q=250, R=0 (c) Q=2004, R=0  
 8. (a) Q=3237, R=0 (b) Q=61091, R=27 (c) Q=172413, R=46  
 9. (a) Q=23, R=69 (b) Q=58, R=60 (c) Q=144, R=180  
 10. (a) Q=1032, R=140 (b) Q=1003, R=153 (c) Q=1004, R=171  
 11. (a) Q=11014, R=475 (b) Q=5168, R=530 (c) Q=21900, R=184  
 12. (a) Q=1187, R=800 (b) Q=29620, R=1703 (c) Q=16994, R=1756  
 13. (a) Q=226, R=1150 (b) Q=1234, R=5678 (c) Q=7764, R=827  
 14. (a) 566076 (b) 2273050  
 15. (a) 5006716 (b) 8687712  
 16. (a) 62813170 (b) 102467288  
 17. (a) 69493500 (b) 217732050  
 18. (a) Q=321, R=0 (b) Q=420, R=0  
 (c) Q=4656, R=34 (d) Q=60308, R=0  
 19. (a) Q=53, R=280 (b) Q=118, R=95  
 (c) Q=24, R=432 (d) Q=32, R=0  
 20. (a) Q=576, R=15 (b) Q=3458, R=3686  
 (c) Q=4953, R=2926 (d) Q=387, R=0

### EXERCISE - 4D

1. 9,18,400 2. 2,32,500 ₹ 3. 9990999  
 4. (a) 217385 (b) 166912  
 5. (a) 34, with ₹ 76 left (b) ₹ 89,180  
 6. (a) Q=71, R=51 (b) 2,46,568  
 7. (a) 8,821 (b) 3,06,000  
 8. ₹ 22100470 9. 8967 10. 1,00,280

**EXERCISE - 4E**

- (a) 535920 (b) 692593 (c) 900
- (a) 15 (b) 5860
- (a) 142 (b) 36 (c) 3840
- (a) True (b) False (c) True (d) False
- (a) 2 (b) 345 (c) 66 (d) 58

**Revision-1**

- XI, XXVII, XXXVI, XLIV, LIV, LXV, LXXIX, LXXXIX, XCI
- 29, 45, 52, 64, 76, 83, 91, 93, 98, 95 respectively
- (a) < (b) < (c) =  
(d) > (e) = (f) >
- (a) XCII, LXXXII, LXXII, LXII, XLII, XXII  
(b) XXVIII, XXXIII, XL, XLIX, LXX, XCII
- (a) XC (b) XCIX (c) LXIV  
(d) LXXXI (e) XC (f) XLIX
- (a) 9,09,099 (b) 73,082 (c) 52,00,37,514  
(d) 4,07,11,353 (e) 3,454,621 (f) 600,278
- (a)  $600000 + 70000 + 2000 + 300 + 80 + 4$   
(b)  $7000000 + 400000 + 0 + 9000 + 200 + 60 + 9$   
(c)  $60000000 + 5000000 + 300000 + 70000 + 4000 + 300 + 0 + 8$
- (a) 2,49,318  
Two lakh forty-nine thousand three hundred and eighteen  
(b) 72,345  
Seventy-two thousand three hundred and forty-five  
(c) 6,52,07,008  
Six crore fifty-two lakh seven thousand and eight  
(d) 35,46,509  
Thirty-five lakh forty-six thousand five hundred and nine  
(e) 47,39,83,000  
Forty-seven crore thirty-nine lakh eighty-three thousand
- (a) 205,871  
Two hundred five thousand eight hundred and seventy-one  
(b) 100,000  
Hundred thousand  
(c) 53,812,916 Fifty-three million eight hundred twelve thousand nine hundred and sixteen  
(d) 4,700,800  
Four million seven hundred thousand eight hundred
- (a) 600,500,000 Six hundred million five hundred thousand
- (a) 90000000, 1000000 (b) 60000, 800000 (c) crores, ten lakhs  
(d) lakhs, ten lakhs (e) ten thousands, lakhs
- (a) 

2,39,48,721	2,68,000	2,53,917	1,00,741	63,352
48,652	3,92,815	4,88,526	20,74,397	1,26,42,614
- (a) 8664320, 2034668 respectively (b) 987521, 125789 respectively
- (a) 4614805 (b) 9333755 (c) 37013400
- (a) 2998889 (b) 64011429 (c) 352231
- (a) 167562 (b) 3182133  
(c) 304820224 (d) 47615940
- (a)  $Q = 1425, R = 52$  (b)  $Q = 654, R = 0$   
(c)  $Q = 4986, R = 9$  (d)  $Q = 1024, R = 0$
- (a) 16 (b) 3848 (c) 24
- (a) ₹ 8,600 19. 86400 seconds
- (a) 1001000 (b) 999960

**MathGym 1**

- (a) 7548 (b) 56184 (c) 437700 (d) 3258072
- (a) 4675 (b) 86152 (c) 1052051 (d) 1340229

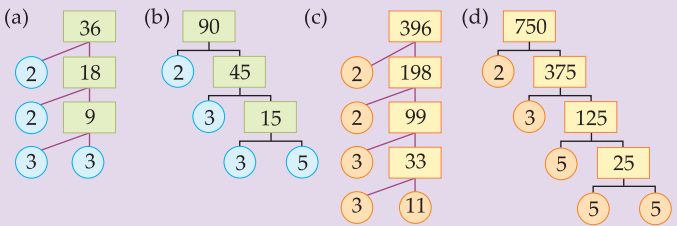
**EXERCISE - 5A**

- (a) 2, 3, 5, 6, 10, 15  
(c) factors (d) divisible
- (a) 5, 10, 15, 20 (b) 99, 96, 93, 90  
(c) 104, 117, 130, 143 (d) 110, 121, 132, 143
- (a) 16, 64, 112 (b) 81, 99, 108 (c) 60, 72, 96
- (a) 21, 42 (b) 12, 24
- (a) 30, 60, 90 (b) 24, 48, 72
- (a) yes (b) no (c) yes (d) no (e) no
- (a) 2, 3, 4, 6, 8, 12 (b) 2, 3, 4, 6, 8, 12, 16

- (a) 2, 3, 6 (b) 3, 5, 15 (c) 2, 3, 6 (d) 3, 5, 15
- 2, 4, 8, 16 (b) 2, 4, 7, 8, 14, 28
- (a) 1000, 1002, 1004, 1006 (b) 90, 92, 94, 96, 98  
(c) 891, 893, 895, 897, 899

**EXERCISE - 5B**

- (a) 3, 47, 53 (b) 7, 13, 29 (c) 2, 5, 19
- (a) 94, 88, 51 (b) 39, 93, 675 (c) 25, 18
- (a) 32, 33, 34, 35, 36, 38, 39, 40, 42, 44 (b) 23, 29, 31, 37, 41, 43
- (a) yes (b) yes (c) yes (d) no
- (a)  $2 \times 2 \times 2 \times 2 \times 2 \times 2$  (b)  $2 \times 2 \times 2 \times 2 \times 7$  (c)  $5 \times 5 \times 5$   
(d)  $3 \times 3 \times 5 \times 5 \times 7$  (e)  $2 \times 2 \times 2 \times 3 \times 3 \times 7 \times 7$



- (a) 1, 3, 5, 15 (b) 1, 2, 3, 6 (c) 1, 2, 7, 14 (d) 1, 3, 5, 15

**EXERCISE - 5C**

- (a) 96, 5628 (b) 70, 235 (c) 2860, 5800 (d) 624, 5043, 2670
- (a) 117, 423, 1287 (b) 891, 3141, 1035 (c) 666, 8685, 25506
- (a) 232, 5056 (b) 7508, 5616, 112848
- (a) 564, 1848, 52668 (b) 1464, 3480 (c) 75, 1380 (d) 252, 8280, 93834
- (a) 605, 93808 (b) 814, 67441 (c) 847, 91718
- (a) 301, 2135 (b) 133, 504, 644, 5439 (c) 91, 3248
- (a) 7016 (b) 644, 55100
- (a) 9 (b) 7 (c) 9 (d) 7
- (a) 2 (b) 2 (c) 1 (d) 0

**EXERCISE - 6A**

- (a) 8 (b) 1 (c) 4 (d) 27
- (a) 42 (b) 9 (c) 5 (d) 3
- (a) 1 (b) 1 (c) 1 (d) 8
- (a) 5 (b) 3 (c) 15 (d) 18 (e) 4
- (a) 9 (b) 15 (c) 28 (d) 16
- (a) 16 (b) 15 (c) 66 (d) 18
- (a) 24 (b) 26 (c) 55 (d) 60
- (a) 19 (b) 12 (c) 9 (d) 18
- (a) 65 (b) 8 (c) 22 (d) 30
- (a) 14 (b) 3 (c) 35
- (a) 30 (b) 75 (c) 12

**EXERCISE - 6B**

- (a) 3 (b) 4 2. (a) 14 (b) 6 3. 6
- (a) 25 (b) 12 5. 6 m 6. 14 ℓ

**EXERCISE - 6C**

- (a) 8 (b) 9 (c) 40 (d) 35
- (a) 24 (b) 60 (c) 48 (d) 42
- (a) 20 (b) 18 (c) 24 (d) 30  
(e) 60 (f) 24 (g) 40 (h) 36
- (a) 440 (b) 252 (c) 210 (d) 60

**EXERCISE - 6D**

- (a) 60 (b) 144 (c) 960 (d) 1050
- (a) 1470 (b) 224 (c) 72 (d) 935
- (a) 288 (b) 147 (c) 525 (d) 432
- (a) 1485 (b) 11700 (c) 1440 (d) 900
- (a) 59136 (b) 4200 (c) 2040 (d) 4620
- (a) 330 (b) 150 (c) 144
- (a) 180 (b) 288 (c) 31500

**EXERCISE - 6E**

- (a) 45 (b) 100 2. (a) 30 (b) 60
- (a) 150 (b) 100 4. 45 5. sixth tile
- 10:00 A.M.

**EXERCISE - 7A**

- (a)  $\frac{3}{4}$  (b)  $\frac{1}{3}$  (c)  $\frac{1}{2}$  (d)  $\frac{2}{3}$
- (a) 12 (b) 11 (c) 41 (d) 16