Rethink Mathematics-6

Chapter-1 Knowing our numbers

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Comparing numbers/ Greatest and Lowest numbers, Ascending and Descending orders, Making numbers by using the given digits.	Children will be able to compare numbers and Understands all numbers are formed by using any of the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 students will be able to form numbers.	Through various situations, make children compare numbers up to 5-digits like cost of two houses, number of spectators present in two etc. Practise the method to make 4-digit, 5-digit, 6-digit numbers using the given digits.	Use > , < or = a) 101011 ☐ 1010011 b) 54334 ☐ 504334
Expanded form of a number Place Value and Place Value	Importance of place values and the method to write a number as the sum of ones, tens, hundreds, thousands etc.	Make the children understand expanded from using different egs. Like $9238 = 9 \times 1000 + 2 \times 100 + 3 \times 10 + 8 \times 1$	Find the product of the sum of the place value and face value of 75 in the number 7437
Indian and International system of numeration. Word problems	Difference between Indian and International system of numeration and their uses.	Give different numbers to understand that Indian system is in terms of hundreds and International system is in terms of thousands.	Express 84329 in indian and international system
Addition, subtraction and Division of large numbers Word problems	Larger number and thus solve perform real life problem	Number patterns could be used to extend numbers up to 8-digits and then daily life situations involving 8-digit numbers could be discussed e.g. cost of property. Involve children in solving daily life problems involving more than one operation and then to appreciate the hierarchy to be decided to carry on different operations.	The population of a town was 2049647 in 2012, 3124975 is 2013 and 3024976 in 2014. State the increase in population from 2013 to 2012 compare the population of 2013 and 2014.

Estimation by rounding off nearest to tens, hundreds, thousands etc. Estimation of sum, difference product and quotant	Children will be able to nearest to tens, hundreds, thousands etc. and their uses in daily life	Make the children understand the method of estimation ie. Less than the middle value to the lower number and more than or equal to the middle number to the higher number. Egs round off 876 to nearest tens as 880 and nearest hundreds as 900.	Estimate the answer for the following to its highest place 1864 – 15 – 810
Conversion of units	The children will be able perform conversion of one unit to another	Practice the rules to convert to given unit to other units through different egs.	Convert a) 86 kg to g b) 1249 g to kg and g

Exercise 1.1

1. Write the following number names in both Indian and International number system:

i) 1543

Indian system – One thousand five hundred forty three.

International system – One thousand five hundred forty three.

ii) 650012

Indian system – Sixty five lakhs and twelve

International – Six millions five hundred thousand twelve

iii) 10576398

Indian system – One crore five lakhs seventy six thousand six hundred ninety eight.

International system – Ten million five hundred seventy six thousand three hundred ninety eight

iv) 88000000

Indian system – Eight crore and eighty lakhs.

International system – Eighty eight millions.

2. Write the place values and face values of the underlined digits.

i) 1743900

Place Value = 900

Face Value = 9

ii) 84200597

Place Value = 80000000

Face Value = 8

iii) 1111111

Place Value = 1000000

Face Value = 1

iv) 654318

Place Value = 50000

Face Value = 5

3. Write the numbers in expanded form.

i) 439621 → 400000 + 30000 + 9000 + 600 + 20 + 1

ii) 173581290 → 100000000 + 70000000 + 3000000 + 500000 + 80000 + 1000 + 200 + 90

iii) 580000 → 500000 + 80000

iv) 10101010 → 10000000 + 0 + 100000 + 0 + 1000 + 0 + 10

4. Find the product of the place values of the underlined digits.

i) 1<u>5</u>73<u>9</u>24

P.V of first digit = 500000

P.V of second digit = 900

∴ Product = 500000 × 900

= 450000000

ii) 28<u>5</u><u>0</u>136

P.V of first digit = 500000

P.V of second digit = 0

∴ Product = 500000 × 0

= 0

iii) <u>9</u><u>9</u>000

P.V of first digit = 90000

P.V of second digit = 9000

∴ Product = 90000 × 9000

= 810000000

iv) <u>2</u>596817

P.V of first digit = 2000000

P.V of second digit = 7

∴ Product = 2000000 × 7

= 14000000

5. Find the difference between the place value and face value of the underlined digits.

i) 1<u>8</u>205105

P.V = 8000000

F.V = 8

∴ Difference = 8000000 – 8

= 7999992

ii) 630005<u>9</u>06

P.V = 900

F.V = 9

∴ Difference = 900 – 9

= 891

iii) 830000

P.V = 0

F.V = 0

∴ Difference = 0 – 0

= 0

iv) 1000009

P.V = 1000000

F.V = 1

∴ Difference = 1000000 – 1

= 999999

6. What is largest 5 digit number.

99999

7. What is the smallest 7 digit number.

1000000

Exercise 1.2

1. Arrange in descending order:

i) 65239 ; 254618 ; 257618 ; 83290 = **Ans.** 257618; 254618; 83290; 65239

ii) 100000 ; 10000 ; 1000000 ; 1000 = **Ans.** 1000000; 100000; 10000; 1000

2. Arrange in ascending order:

i) 99999; 999999 ; 9999999 ; 9999

Ans. 999, 99999, 999999; 9999999

ii) 123456 ; 1234567 ; 1023453 ; 10000000

Ans. 123456; 1023453; 1234567; 10000000

3. Inset <, > or =

i) 64000000 $\boxed{>}$ 295000 ii) 1000000 $\boxed{<}$ 10000000

iii) 24563100 $\boxed{>}$ 245631 iv) 777777 $\boxed{=}$ 777777

4. Find the smallest number in each row.

i) 100000 ; 100005; 100050; 1000005 **Ans.** 100000

ii) 29342934 ; 29351351; 29351648; 29000000 **Ans.** 29000000

Exercise 1.3

1. Write all possible 2-digit number that can be formed using the digit 3, 4 and 8.

Ans. 34, 33, 38, 43, 44, 48, 83, 84, 88

2. Write all possible 3-digit numbers using the digits 3, 0 and 5. Repetition of digits is not allowed. Also find their sum.

305, 350, 503, 530

Sum = 305 + 350 + 503 + 530

= 1688

3. Write the smallest and largest 5-digit number ending in 2, no repetition allowed.

Smallest = 10342

largest = 98762

4. Write down the smallest and largest 4 digit number that can be formed using the digits 2, 3, 0 and 9 using each digit only once.

Smallest = 2039

Largest = 9320

5. Form the smallest and greatest 4-digit numbers by using any one digit twice from the digits 8, 0, 2, 5.

Smallest = 2005

largest = 8852

6. Find the sum of the largest 2-digit number and smallest 7-digit number.

Largest 2-digit number = 99

Smallest 2-digit number = 1000000

$\therefore$ Sum = 100000 + 99

= 1000099

7. Find the product of the smallest 3-digit number ending in 2 and the smallest 2-digit number ending in 5.

Smallest 3-digit number ending in 2 = 102

Smallest 2-digit number ending in 5 = 15

$\therefore$ Product = 102×15

= 1530

8. Write the smallest 6 digits number using four different digits.

Smallest 6 digit number using four different digits is 100023

9. Write the greatest 7-digit number using distinct digits.

Greater 7 digit number using district digits 9876543

Exercise 1.4

1. Round off each of the following number to nearest tens.

i) 88 → 90 ii) 203 → 200

iii) 1305 → 1310 iv) 333 → 330

2. Round off each of the following numbers to nearest hundreds.

i) 304 → 300 ii) 4035 → 4000

iii) 13755 → 13800 iv) 7665 → 7700

3. Round off each of the following numbers to nearest thousands.

i) 3025 → 3000 ii) 65664 → 66000

iii) 1345 → 1000 iv) 25527 → 26000

4. Round off 128963 to its highest place.

100000

5. Round off 675490 to nearest.

i) hundreds → 675500 ii) thousands → 675000

iii) ten thousands → 680000

6. Find the sum by suitable estimation.

i) $54 + 67$

Round off to nearest en and adding

= $50 + 70$

= 120

ii) $129 + 323$

Round off to get

= $100 + 300$

= 400

iii) $1842 + 645$

Rounding off to get

= $2000 + 600$

= 2600

7. Find the difference by suitable estimation.

i) $78 - 31$

= $80 - 30$

= 50

ii) $4918 - 3951$

= $5000 - 4000$

= 1000

iii) $54005 - 291$

= $50000 - 300$

= 49700

8. Find the product by suitable estimation.

i) 47×28

= 50×30

= 1500

ii) 395×58

= 400×60

= 24000

iii) 2413×501

= 2000×500

= 1000000

9. Estimate the quotient to nearest ten.

(i) $423 \div 19$

Rounding off 423 to 400 and 19 to 20 and then dividing

$$= \frac{\cancel{400}^{20}}{\cancel{20}_{1}} = 20$$

(ii) $574 \div 190$

Rounding off both numbers to nearest hundred

$= 600 \div 200$

$$= \frac{\cancel{600}^{3}}{\cancel{200}_{1}} = 3$$

(iii) $3815 \div 35$

Rounding off 3815 to 4000 and 35 to 40 and then dividing

$$= \frac{\cancel{4000}^{100}}{\cancel{40}_{1}} = 100$$

Exercise 1.5

1. The number of books sold on day 1 was 153894 and on day 2 was 2,05,910. What is the total number of books sold? Which day more books were sold and by how much?

No. of books sold on day 1 =	1 5 3 8 9 4
No. of books sold on day 2 =	+ 2 0 5 9 1 0
∴ Tolal no. of books sold =	3 5 9 8 0 4

As, 153894 $\boxed{<}$ 205910

∴ No. of books sold on day 2 were more than that of day 1.

The book were more by = 205910 – 153894

= 52016

∴ Ans. Total = 359804 books. Day 2 books sold was more by 52016.

2. Ash has 10 books weighing 8 kg 500 g. Find the weight of 5 books.

Weight of 10 books = 8 kg 500 g = 8500g

Weight of 1 book = 8500g ÷ 10

= 850g

∴ Weight of 5 books = 850g × 5

= 4250g

Ans. 9 or 4 kg. 250 gm

3. Suman has 649800 flowers in her garden. She sold 158000 flowers. How many flowers are left in her garden?

No. of flowers Suman had = 6 4 9 8 0 0 flowers
No. of flowers sold = – 1 5 8 0 0 0 flowers
∴ No. of flowers left in the garden = 4 9 1 8 0 0 flowers

∴ **Ans.** 491800 flowers.

4. A milkman fills 1200 ml of milk in 20 bottles. What is the capacity of each bottle?

Capacity of 20 bottles = 1200 mL

$$\therefore \text{ Capacity of 1 bottle } = \frac{120\cancel{0}}{2\cancel{0}} = 60\,\text{ml}$$

∴ **Ans.** 60 ml

5. The population of a city in the year 1998 was 2 Lakhs and in 1999 it was 3 lakhs 48 thousand. Find the increase in population.

Population of city in 1999 = 3, 48, 000
Population of city in 1998 = – 2, 00, 000
∴ Increase in population = 1, 48, 000

∴ **Ans.** 1,48,000 people

6. A company sells 12589610 bottles of cold drink in May and 32984600 bottles in June. What is the difference in the sale between the two months?

No. of cold drink bottles sold in June = 3 2 9 8 4 6 0 0
No. of cold drink bottles sold in May = – 1 2 5 8 9 6 1 0
∴ Difference in Sale = 2 0 3 9 4 9 9 0

∴ **Ans.** 20394990 cold drink bottles

7. A man has 27 hens each weighing 3200g. Find the total weight of hens.

Weight of 1 hen = 3200g
∴ Wight of 27 hens = 3200g × 27
= 86400g

∴ **Ans.** 86400g. or 86 kg 400gm.

8. What must be added to 1 crore to make it 2 crore 9 lakh?

2,09,00,000 – 1,00,00,000
= 1,09,00,000
= 1 crore 9 lakh

SELF ASSESSMENT-1

1. Write the place value and face value of the underlined digits.

(a) 4 3 5 2

Place value = 50

Face value = 5

(b) 8 9 4 1

Place value = 800

Face value = 8

2. How many two digits numbers are there?

100 – 10

= 90

∴ **Ans.** 90 two-digit numbers.

3. Find the difference in the place value of 2.

(a) 2885927

P.V of first '2' = 2000000

P.V of second '2' = 20

∴ Difference = 2000000 – 20

= 1999980

(b) 842253

P.V of first '2' = 2000

P.V of second '2' = 200

∴ Difference = 2000 – 200

= 1800

4. Write the smallest and biggest 5 digit number using 0, 1, 7, 9.

Smallest = 10079

Largest = 99710

5. Give three consecutive successors of 9998.

9999, 10000, 10001

6. How many numbers lie between 100 and 400?

(a) 299 numbers lie between 100 and 400

7. The successor of the predecessor of 8732.

(b) 8732

8. The product of the place values of 7 in 17327 is

(c) 49000

9. The difference between the successor and predecessor of 1000 is

(c) 2

10. The number 58679 rounded off to the nearest hundreds is

(a) 58700

11. The sum of the predecessor and successor of 1000 is

(c) 2000

12. The quotient when the place value of 5 in 635920 is divided by its face value.

(d) 1000

13. The smallest four digit odd number is

(b) 1001

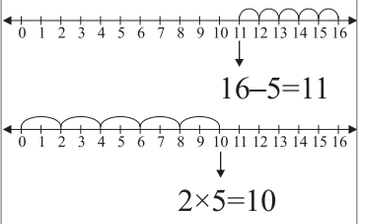
14. The number 85293 rounded of its highest place is

(b) 90000

15. The face value of 3 in 348971 is

(b) 3

Chapter-2 Whole Numbers

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Whole Numbers - Predecessor and successor	To the children will be able write number and before the given number	Make the children understand predecessor =given number–1 and successor=given number + 1 Predecessor of 39456–1 =39455 Successor of 25899 = 29599 + 1 = 25900	Find the whole number whose successor is the predecessor of 2462
Whole Numbers on number line, addition, subtraction and multiplication on the number line.	To draw the number line and represent the whole numbers on the number line	Make the children understand the operations of whole numbers on number line by demonstrating the method in different problems.  	Multiply 5 × 4 using number line
Properties of whole numbers	To apply the different properties in reducing the difficulty in addition, subtraction, multiplication and division	Simplify different problems by using commutativity, associativity and distributivity and make the children able to apply the properties in simplifying problems. 4×26×25 = (4×25)×16= 100×16=2600 2456×85+2456×15= 2456 (85+15) = 2456× 100=245600	Fill in the blanks. 898 + (549 + 132) = (898 + ____) + 132

Exercise 2.1

1. Write the smallest whole number.

Ans. Smallest whole no. is 0

2. Find the successor of :

i) 3849, 3850 ii) 2900, 2901 iii) 53005, 53006

iv) 2469, 2470 v) 13584, 13585

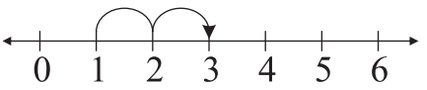
3. Find the predecessor of :

i) 1, 0 ii) 2399, 2398 iii) 8300, 8299

iv) 1001, 1000 v) 60085, 60084

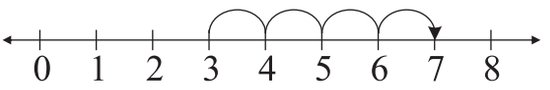
4. Solve the following using the number line :

i) $1 + 2$



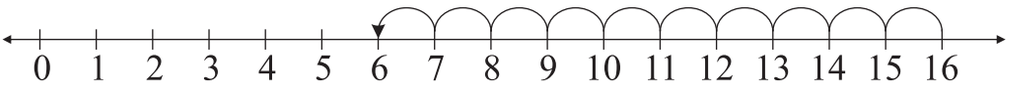
$\therefore\ 1 + 2 = 3$

ii) $3 + 4$



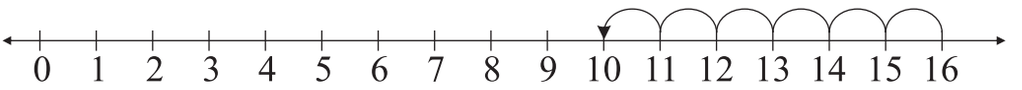
$\therefore\ 3 + 4 = 7$

iii) $16 - 10$



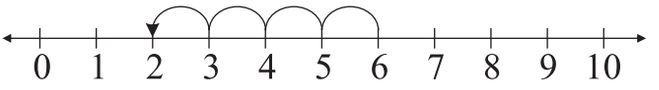
$\therefore\ 16 - 10 = 6$

iv) $10 + 8$



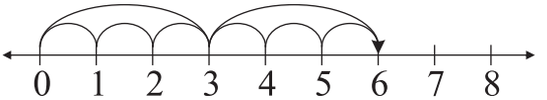
$\therefore\ 10 + 8 = 18$

v) $6 - 4$



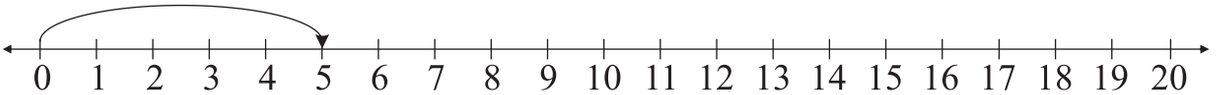
$\therefore\ 6 - 4 = 2$

vi) 3×2



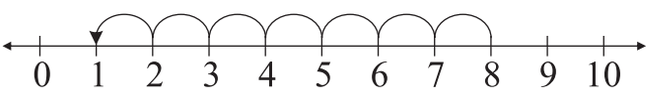
$\therefore\ 3 \times 2 = 6$

vii) 5×4



$\therefore\ 5 \times 4 = 20$

viii) $8 - 7$



$\therefore\ 8 - 7 = 1$

5. State true or false:

i) 1 is the predecessor of 0. **(False)**

ii) Whole number starts from 0. **(True)**

iii) The sum of whole numbers is not a whole number. **(False)**

iv) On the number line 4 lies to the left of 3. **(False)**

v) The successor of 18 is 20. **(False)**

6. Write the next four consecutive whole number after 2643.

Next 4 numbers = 2644, 2645, 2646, 2647

7. Write the number whose predecessor is 72399.

72400 is the predecessor of 72399

8. Write the whole number whose successor is 28300.

28299 si the number

9. Write 3 consecutive numbers occurring just before 25001.

24998, 24999, 25000

10. How many 2-digit whole numbers are there between 16 and 19?

2 whole number lie between 16 and 19

Exercise 2.2

1. Fill in the blanks.

i) $29 \times \mathbf{64} = 64 \times 29$

ii) $6486 \times 0 = \mathbf{0}$

iii) $54 + \mathbf{0} = 54$

iv) $18 + 17 = 17 + \mathbf{18}$

v) $(22 \times 20) \times 23 = 22 \times (\mathbf{20} \times 23)$

vi) $1 \times 0 = \mathbf{0}$

vii) $354 \div 354 = \mathbf{1}$

viii) $(18 + 27) + 5 = 18 + (\mathbf{5} + 27)$

ix) $29 \times 54 = 29 \times (50 + \mathbf{4})$

x) $64 \times (5 + 80) = 64 \times 5 + \mathbf{64} \times 80$

2. Find the products using distributive property.

i) 785×102
$= 785 \times (100 + 2)$
$= 78500 + 1570$
$= 80070$

ii) 29×530
$= 530 \times (30 - 1)$
$= 1590 - 530$
$= 15370$

iii) 1009×990
$= 990 \times (1000 + 9)$
$= 99000 + 8910$
$= 998910$

iv) 6075×110
$= 6075 \times (100 + 10)$
$= 607500 + 60750$
$= 668250$

v) 389×98
$= 389 \times (100 + 2)$
$= 38900 - 778$
$= 38122$

vi) 28×59
$= 28 \times (50 + 9)$
$= 1400 + 252$
$= 1652$

3. State true or false.

i) The product of two whole numbers is a whole number. **True**

ii) $a \div a = 1$ **True** (If a ÷ a non zero number)

iii) $596 \times 0 = 596$ **False**

iv) Division satisfies the closure property. **False**

v) $a \times (b + c) = a \times b + b \times c$ **False**

4. Simplify each expression. Identify the property used.

i) $8+23+2$

$(8+2)+23$

$= 10+23$

$= 33$

Associative property

ii) $20+(63+80)$

Using Associative property

$(80+20)+63$

$= 100+63$

$= 163$

iii) $8+13+7+12$

Using Associative property,

$(13+7)+(12+8)$

$= 20+20$

$= 40$

5. Solve the following by suitable re-arrangements.

i) $869+73+237+31$

$= (869+31)+(73+237)$

$= 900+310$

$= 1210$

ii) $17\times125\times14\times8.$

$= (125\times8)\times(14\times17)$

$= 1000\times238$

$= 238000$

6. Find the products using associative property.

i) $25\times29\times4$

$= (25\times4)\times29$

$= 100\times29$

$= 2900$

ii) $50\times95\times2$

$= (50\times2)\times95$

$= 100\times95$

$= 9500$

iii) $39\times5\times200$

$= (200\times5)\times39$

$= 1000\times39$

$= 39000$

Exercise 2.3

1. A store has 59 coolers and 1 heater. How many coolers and heaters are there in 40 such stores?

i) No of coolers in 1 store $=$ 59 coolers

No. of heaters in 1 store $=$ 1 heater

$\therefore$ No. of coolers in 40 store $= 59\times40$

$= 2360$ coolers

No. of heaters in 40 stores $= 1\times40$

$= 40$ heaters

$\therefore$ **Ans.** 2360 coolers and 40 heaters

2. A television set costs ₹ 11500. If I get a discount of ₹ 500 on the television. Find the cost of 35 such televisions.

Cost of 1 television after discount $=$ ₹ 11500 – ₹ 500

$=$ ₹ 11000

$\therefore$ Cost of 35 televisions $=$ ₹ 11000×35

$=$ 385000 ₹

$\therefore$ **Ans.** ₹385000.

3. The price of a flat reduced from ₹ 175000 to ₹ 150000. Find the reduction in cost of 85 such flats.

Reduction of price in 1 to flat = ₹ 175000 – ₹ 150000

= ₹ 25000

∴ Reduction of price in 85 flats = ₹ 25000 × 85

= ₹ 2125000

∴ **Ans.** ₹ 2125000.

4. A bookshop has 600 english books, 400 hindi books and 500 bengali books. Find the number of books in 28 such bookshops.

No of books in 1 shop = (600 + 400 + 500) books

= 1500 books

∴ No. of books in 28 shops = 1500 × 28

= 42000 books

∴ **Ans.** 42000books.

5. A parking lot has 111 cars. 11 cars were taken aside for painting. How many cars are there in 45 such parking lots?

No. of cars in 1 parking lot = 111 – 11 cars

= 100 cars

∴ No. of cars in 45 parking lots = 100 × 45

= 4500 cars

∴ **Ans.** 4500 cars.

6. I read 26 pages of a book on Monday, 19 pages on Tuesday and 17 pages on Wednesday. What is the total no. of pages I read? Will the total no. of pages change if I read 7 pages on Tuesday and 9 pages on Wednesday?

No. of pages read on Monday = 26 pages

No. of pages read on Tuesday = 19 pages

No. of pages read on Wednesday = 17 pages

∴ Total no. of pages read = 26 + 19 + 17 page

= 62 pages.

∴ **Ans.** 62 pages; No. the total no. of pages will not change.

7. Draw the pattern for the following numbers.

i) 2

ii) 10

iii) 12

iv) 9

SELF ASSESSMENT-2

1. Find the product of largest 5 digit number and smallest 3 digit number.

Largest 5-digit number = 99999

Smallest 3-digit number = 100

$\therefore$ Product = 99999×100

= 9999900

2. Simplify

i) $81 \div 9 - 9 \times 1$

$= \frac{81^{9}}{\cancel{9}_{1}} - 9 \times 1$

$= 9 - 9$

$= 0$

ii) $64 \times 20 - 58 \times 50 \div 10$

$= 64 \times 20 - 58 \times \frac{\cancel{50}^{5}}{\cancel{10}}$

$= 1280 - 58 \times 5$

$= 1280 - 290$

$= 990$

3. What will be the price of 10 books if 5 books cost ₹ 600?

Cost of 1 book $= \frac{\cancel{600}^{120}}{\cancel{5}_{1}}$

$\therefore$ Cost of 10 books = 120×10

= 1200

$\therefore$ Cost of 10 books = ₹1200

4. I scored 75 in English, 80 in Math, 60 in Science. What is my total score?

Total score = $75 + 80 + 60$

= 215 marks

$\therefore$ **Ans.** 215 marks.

5. Find the number that exceeds 98765 by 4000.

$98765 + 4000$

= 102765

6. The only number which when divided by 1 gives 0 as the answer.

(b) 0

7. The product of 723 and 250 will be_____ digit number.

(a) 6

8. Closure property is not satisfied by

(c) Subtraction

9. The product of two numbers is 1200. If one number is 8, the other number is

(d) 150

10. Commutative property of multiplication.

(a) $x \times y = y \times x$

11. The sum of multiplicative identity and additive identity is

(a) 1

12. The product of multiplicative identity and additive identity is

(b) 0

13. Associative property is related to _____ of numbers.

(b) grouping

14. The closure property is not satisfied by _____.

(c) division

15. To multiply 32 × 85, we use _____ property.

(b) distributive

Chapter-3 Playing with Numbers

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Playing with Numbers: Factors and Multiples, Prime numbers and composite numbers	Children will be able to Class if numbers in various categories including even, odd, prime, composite, co-prime, etc.	Involve children in classification of numbers on the basis of their properties like even, odd, multiples and factors. Make the children write the factors and multiples of given numbers through worksheets	1) State the factors and 5 multiples of 18. 2) State one common multiple of 14.
Tests for divisibility of numbers visibility rules of 2, 3, 4, 5, 10 and 11	Children will be able to check the numbers dissolubility using the rules Verify whether a given number is divisible by 2 or 3 or 4 or etc without division.	Let children form multiplication tables of different numbers like 2, 3, 4, etc and then from the multiplication facts, ask them to identify the pattern like multiple of 3 has sum its digits divisible by 3, multiple of 5 has either 5 or zero in its one's place, etc. Make the table of divisibility rules and apply the rules in different numbers given	1) State the factors and 5 multiples of 18. 2) State one common multiple of 14.

HCF and LCM of given numbers using different methods.	Applies prime factorization to find HCF and LCM of numbers.	Demonstrate the method of prime factorization and other methods to find the LCM and HCF Division method to calculate HCF worksheets to be done.	1) Find the HCF and LCM of 90 and 144. 2) Are the product of HCF and LCM (Calculated above) equal to the product of the numbers.
Word problem based on HCF and LCM of numbers and relation between HCF and LCM	Devises her/his strategies to identify appropriate situations to use the concepts of HCF and LCM.	Explain different day today situations in which LCM and HCF are to be calculated.	

Exercise 3.1

1. Fill in the blanks.

i) 1 is neither **prime** nor **composite**.

ii) A number having exactly two factors is called **prime number**.

iii) The smallest even prime number is **2**.

iv) A number having more than two factors is called **composite number**.

v) The first multiple of 7 is **14**.

2. Check if the first number is a multiple of the second number.

(i) Yes (ii) No (iii) No (iv) Yes

3. Find the prime factors of

i) $72 - 2, 3$ ii) $100 - 2, 5$ iii) $48 - 2, 3$ iv) $225 - 3, 5$

4. List the first 5 multiple of

i) 8 – 8, 16, 24, 32, 40 ii) 20 – 20, 40, 60, 80, 100

iii) 24 – 24, 48, 72, 96, 120 iv) 90 – 90, 180, 270, 360, 450

5. Find three factors of each which are composite.

i) 36 – 4, 6, 9 ii) 1000 – 10, 20, 25

iii) 75 – 25, 15, 75 iv) 200 – 4, 10, 20

6. List all the prime numbers between

i) 1 to 20 = 2, 3, 5, 7, 11, 13, 17, 19

ii) 91 to 110 = 97, 101, 103, 107, 109

iii) 115 to 120 =

7. List all the odd numbers between

i) 24 to 33 = 25, 27, 29, 31 ii) 79 to 89 = 81, 83, 85, 87

iii) 2 to 5 = 3

8. State true or false.

i) The sum of two odd numbers is odd. **False**

ii) The factor of a number is greater than the number. **False**

iii) All even numbers are divisible by 3. **False**

iv) Every number is a multiple of 1. **True**

v) Every prime number has exactly two factors. **True**

vi) Every number has uncountable factors. **False**

9. What is the greatest prime number between 1 and 20?

19

10. Which of the following pairs of numbers are co-prime?

i) 12 and 35 are co-prime

ii) 15 and 37 are co-prime

iii) 27 and 32 are co-prime

Exercise 3.2

1. Using the divisibility tests, check which of the following numbers are divisible by a) 2, b) 3, c) 6

i) 63
- a) by 2 – No
- b) by 3 – Yes
- c) by 6 – No

ii) 53
- a) by 2 – No
- b) by 3 – No
- c) by 6 – No

iii) 100
- a) by 2 – Yes
- b) by 3 – No
- c) by 6 – No

iv) 102
- a) by 2 – Yes
- b) by 3 – Yes
- c) by 6 – Yes

v) 297
- a) by 2 – No
- b) by 3 – Yes
- c) by 6 – No

vi) 636
- a) by 2 – Yes
- b) by 3 – Yes
- c) by 6 – Yes

iv) 1072
- a) by 2 – Yes
- b) by 3 – Yes
- c) by 6 – Yes

2. Using the divisibility tests, check which of the following numbers are divisible by a) 4, b) 8

i) 128
by 4 – Yes
by 8 – Yes

ii) 626
by 4 – No
by 8 – No

iii) 1024
by 4 – Yes
by 8 – Yes

iv) 5048
by 4 – Yes
by 8 – Yes

v) 1004
by 4 – Yes
by 8 – No

vi) 4842
by 4 – No
by 8 – No

3. Using the divisibility tests, check which of the following numbers are divisible by a) 9, b) 11

i) 3366
by 9 – Yes
by 11 – Yes

ii) 784
by 9 – No
by 11 – No

iii) 5932102
by 9 – No
by 11 – Yes

iv) 1035
by 9 – Yes
by 11 – No

v) 6127
by 9 – No
by 11 – Yes

vi) 37852
by 9 – No
by 11 – Yes

4. Determine if 78240 is divisible by 11.

Sum of even digits = 4 + 8

= 12

Sum of odd digits = 0 + 2 + 7

= 9

Difference = 12 – 9 = 3

Ans. As the differences is nether 0 nor 11. Therefore 78240 is not divisible by 11.

Exercise 3.3

1. Find three common multiples of :

i) 2, 3, 5 — 30, 60, 90

ii) 5, 10, 20 — 10, 40, 60

iii) 6, 8 — 24, 48, 72

iv) 10, 30 — 30, 60, 90

2. Find the common factors of :

i) 12, 16 — 2, 4, 1

ii) 8, 16, 24 — 8, 1, 2, 4

iii) 25, 30 — 5, 1

iv) 16, 18 — 2, 1

3. Find the prime factors of :

i) 64 — 2

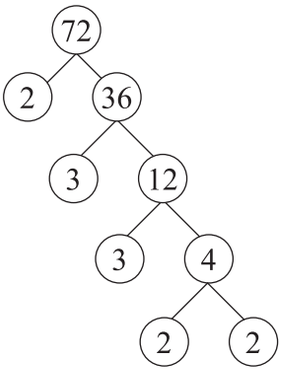
ii) 75 — 3, 5

iii) 120 — 2, 3, 5

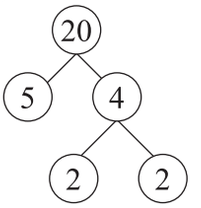
iv) 91 — 7, 13

4. Construct the factor tree for the following numbers.

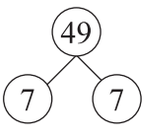
i) 72



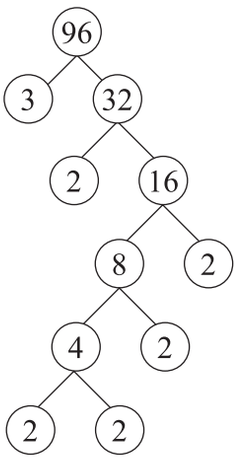
ii) 20



iii) 49



iv) 96



5. Find the prime factorisation using division method.

i) 48

2	48
2	24
2	12
2	6
3	3
	1

ii) 84

2	84
2	42
3	21
7	7
	1

iii) 2900

5	2900
5	580
2	116
2	58
29	29
	1

iv) 150

5	150
5	30
2	6
3	3
	1

6. State true or false

i) If a number is divisible by 3 it must be divisible by 9. **False**

ii) If a number is divisible by 9 it must be divisible by 3. **True**

iii) Prime factorisation involves composite numbers. **False**

iv) 1 is the common factor for all numbers. **True**

v) A multiple of 4 is also a multiple of 8. **False**

7. Write the largest 2 digit number in terms of its prime factors.

99

8. What is the common factor of largest 3 digit number and smallest four digit number?

Largest 3-digit number = 999

Smallest 4-digit number = 1000

Common factor = 1

9. Write the greatest 4-digit number and find its prime factorization.

3	9999
3	3333
11	1111
101	101
	1

$\therefore 9999 = 3 \times 3 \times 11 \times 101$

Exercise 3.4

1. Find the HCF by factor listing method.

i) 20, 30

The common factors are – 1, 2, 5, 10

As, 10 is the highest

Therefore 10 is the H.C.F of 20 and 30.

ii) 25, 35

The common factors are – 1, 5

As, 5 is the highest

Therefore 5 is the H.C.F of 25 and 35

iii) 45, 30, 60

The common factors are – 3, 5, 1, 15

As, 15 is the highest

Therefore 15 is the H.C.F of 45,30,60

iv) 14, 21, 35

The common factors are – 1, 7

As, 15 is the highest

Therefore 7 si the H.C.F of 14,21,35

v) 18, 24

The common factors are – 3, 2, 6, 1

As, 6 is the highest

Therefore 6 is the H.C.F of 18, 24

vi) 56, 24

The common factors are – 1, 2, 8

As, 8 is the highest

Therefore 8 is the H.C.F of 56 and 24

2. Find the HCF by prime factorisation method.

i) 49, 56

7	49
7	7
	1

7	56
2	8
2	4
2	2
	1

$49 = (7) \times 7$
$56 = (7) \times 2 \times 2 \times 2$
$\therefore$ H.C.F = 7

ii) 36, 48

3	36
3	12
2	4
2	2
	1

2	48
2	24
2	12
2	6
3	3
	1

$36 = ③ \times 3 \times (2) \times (2) \times 2$
$48 = 2 \times 2 \times (2) \times (2) \times ③$
$\therefore$ H.C.F = $3 \times 2 \times 2$
= 12

iii) 66,55

11	66
2	6
3	3
	1

11	55
5	5
	1

$66 = (11) \times 2 \times 3$
$55 = (11) \times 5$
$\therefore$ H.C.F = 11

iv) 12,48,54

2	12
2	6
3	3
	1

2	48
2	24
2	12
2	6
3	3
	1

2	54
3	27
3	9
3	3
	1

$12 = (2) \times 2 \times (3)$
$48 = (2) \times 2 \times (3) \times 2 \times 2$
$54 = (2) \times 3 \times (3) \times 3$
$\therefore$ H.C.F = $2 \times 3 = 6$ **Ans.**

v) 44, 60, 36

11	44
2	4
2	2
	1

3	60
5	20
2	4
2	2
	1

3	36
2	12
2	6
3	3
	1

$44 = 11 \times 2 \times (2)$
$60 = 3 \times 5 \times (2) \times ②$
$36 = 3 \times ② \times (2) \times 3$
$\therefore$ H.C.F = 2×2
= 4

vi) 24,36,60

2	24
2	12
2	6
3	3
	1

3	36
2	12
2	6
3	3
	1

3	60
2	20
2	10
5	5
	1

$24 = 2 \times (2) \times (2) \times ③$
$36 = 3 \times (2) \times (2) \times ③$
$60 = ③ \times (2) \times (2) \times 5$
$\therefore$ H.C.F = $2 \times 2 \times 3$
= 12 **Ans.**

3. Find the HCF of

i) two consecutive odd numbers

Two consecutive odd numbers = 5 and 7.

$$\begin{array}{r|l} 5 & 5 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 7 & 7 \\ \hline & 1 \end{array}$$

$\therefore$ H.C.F = 1

ii) two consecutive even numbers

Two consecutive even numbers = 5 and 7.

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

$2 = \boxed{2} \times 1$

$4 = \boxed{2} \times 2 \times 1$

$\therefore$ H.C.F = 2

iii) two consecutive prime numbers.

Two consecutive prime numbers = 3 and 5.

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

$\therefore$ H.C.F = 1

4. Find the HCF using division method.

i) 56, 42, 98

$$\begin{array}{l} 42\overline{)56}(1 \\ \quad -42 \\ \hline 14\overline{)42}(3 \\ \quad -42 \\ \hline \quad \times \end{array}$$

$$\begin{array}{l} 14\overline{)98}(7 \\ \quad -98 \\ \hline \quad \times \end{array}$$

$\therefore$ H.C.F = 14

ii) 80, 16, 96

$$\begin{array}{l} 80\overline{)96}(1 \\ \quad -80 \\ \hline 16\overline{)80}(5 \\ \quad -80 \\ \hline \quad \times \end{array}$$

$$\begin{array}{l} 16\overline{)16}(1 \\ \quad -16 \\ \hline \quad \times \end{array}$$

$\therefore$ H.C.F = 16

iii) 120, 240, 360

$$\begin{array}{l} 120\overline{)240}(2 \\ \quad -240 \\ \hline \quad \times \end{array}$$

$$\begin{array}{l} 120\overline{)360}(3 \\ \quad -360 \\ \hline \quad \times \end{array}$$

$\therefore$ H.C.F = 120

iv) 158 and 200

$$\begin{array}{l} 42\overline{)200}(1 \\ \quad -158 \\ \hline 42\overline{)158}(3 \\ \quad -126 \\ \hline 32\overline{)42}(3 \\ \quad -32 \\ \hline 10\overline{)32}(3 \\ \quad 30 \\ \hline 2\overline{)10}(5 \\ \quad -10 \\ \hline \quad \times \end{array}$$

$\therefore$ H.C.F = 2

v) 495 and 945

$$\begin{array}{l} 495\overline{)945}(1 \\ \quad -495 \\ \hline 450\overline{)495}(1 \\ \quad -450 \\ \hline 45\overline{)450}(10 \\ \quad -450 \\ \hline \quad \times \end{array}$$

$\therefore$ H.C.F = 45

Exercise 3.5

1. A

   i)

Exercise 3.6

1. Find the smallest number which on being added to 10 is exactly divisible by 35, 75, 105.

5	35, 75, 105
7	7, 15, 21
3	1, 15, 3
5	1, 5, 1
	1, 1, 1

$\therefore$ L.C.M $= 5 \times 7 \times 3 \times 5$

$= 525$

$\therefore$ The number is $525 - 10$

$= 515$

2. Find the greatest number which divides 545, 9473 and 10205 leaving behind remainder of 5 in each case.

$545 - 5 = 540$

$9473 - 5 = 9468$

$10205 - 5 = 10200$

$9468\overline{)10200}(1$
-9468
$732\overline{)9468}(12$
-8784
$684\overline{)732}(1$
-684
$48\overline{)684}(14$
-672
$12\overline{)540}(4$
-540
$\times$

$12\overline{)540}(45$
-540
$\times$

$\therefore$ 12 is the greatest number that divides 545, 9473 and 10205 leaving 5 remainder in each case.

3. Find the largest number which divides 481, 125, 249 leaving remainder 1, 5 and 9 respectively.

$481 - 1 = 480$

$125 - 5 = 120$

$249 - 9 = 240$

$240\overline{)480}(2$
-480
$\times$

$120\overline{)240}(2$
-240
$\times$

$\therefore$ H.C.F = 120

$\therefore$ 120 is the largest number that divides 481, 125 and 249 leaving remainder 1, 5 and 9 respectively.

4. Find the smallest number which when divided by 55, 110, 22 leaves a remainder of 20.

11	55, 110, 22
5	5, 10, 2
2	1, 2, 2
1	1, 1, 1

$\therefore$ L.C.M $= 11 \times 5 \times 2$

$= 110$

$110 + 20$

$\therefore$ **Ans.** 130

5. What is the least number of plants that can be arranged in rows of 12, 18 and 24 in each row?

3	12, 18, 24
2	4, 6, 8
2	2, 3, 4
2	1, 3, 2
3	1, 3, 1
	1, 1, 1

$\therefore$ L.C.M $= 3 \times 2 \times 2 \times 2 \times 3$
$= 72$

6. A red light blinks at intervals of 20 minutes and green light at 30 minutes. If they blink together at 5:30 p.m, when will they blink together again?

5	20, 30
2	4, 6
2	2, 3
3	1, 3
	1, 1

$\therefore$ L.C.M $= 5 \times 2 \times 2 \times 3$
$=$ 60 minutes or 1 hr

If they blink together at 5:30 p.m then they will blink together next at 5:30 + 1 hr = 6:30 p.m.

7. A number of students can be arranged in groups of 3, 4, 6, 8. Find the least number of students required.

2	3, 4, 6, 8
2	2, 2, 3, 4
2	3, 1, 3, 2
3	3, 1, 3, 1
	1, 1, 1, 1

$\therefore$ L.C.M $= 2 \times 2 \times 2 \times 3$
$= 24$

$\therefore$ **Ans.** 24 students required.

8. Two wires 140 m and 210 m are to be cut into pieces of equal size. Find the length of the longest piece that can be cut.

$140\overline{)210}(1$
-140
$70\overline{)140}(1$
-140
$\times$

$\therefore$ H.C.F $=$ 70
$\therefore$ **Ans.** $=$ 70m

9. 450 apples, 650 oranges and 600 mangoes are packed into cartoons. What is the biggest possible number of cartoons required?

$600\overline{)650}(1$
-600
$50\overline{)600}(12$
-600
$\times$

$50\overline{)450}(9$
-450
$\times$

$\therefore$ H.C.F $=$ 50
$\therefore$ **Ans.** 50 cartoons required.

10. A baker arranges 240 cakes, 300 burgers and 480 sandwiches on some racks. What is the highest number of racks required so that no items are left behind?

$240\overline{)300}(1$
-240
$60\overline{)240}(4$
-240
$\times$

$60\overline{)480}(8$
-480
$\times$

$\therefore$ H.C.F $=$ 60
$\therefore$ **Ans.** $=$ 60 racks required.

SELF ASSESSMENT-3

1. Find the LCM of 8 and 40.

2	8, 40
2	4, 20
2	2, 10
5	1, 5
	1, 1

$\therefore$ L.C.M $= 2 \times 2 \times 2 \times 5$
$= 40$

2. Find the HCF of 15 and 45.

$$15\overline{)45}\,(3$$
$$-45$$
$$\times$$

$\therefore$ L.C.M $= 15$

3. List 3 common factors of 36 and 8.

2, 4 and 1

4. List 3 common multiples of 4 and 12.

12, 48, 24

5. Find the smallest number which when divided by 12, 20 and 24 will leave a remainder of 5 in each case.

2	12, 20, 24
2	6, 10, 12
2	3, 15, 6
3	3, 5, 3
5	1, 5, 1
	1, 1, 1

$\therefore$ L.C.M $= 2 \times 2 \times 2 \times 3 \times 5$
$= 120$
$\therefore$ **Ans.** $120 + 5 = 125$

6. The product of two number is 48. If their HCF is 2, their LCM is

(c) 24

7. Multiple of a number is always _____ the number.

(b) more than or (c) equal to

8. If two numbers are co-prime then their common factor is

(c) 1

9. The sum of 11 even numbers is

(b) even

10. A number divisible by 10 is divisible by

(c) both a and b

11. The HCF of two prime number is

(a) 1

12. The LCM of 30 and 60 is

(b) 60

13. LCM of two numbers is 60. If their HCF is 1 then the numbers are

(a) 12, 5

14. The LCM of two co-prime number is their

(b) product

15. 9 is a factor of which of the following number?

(c) 729

Chapter-4 Sets

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
♦ Introduction to sets ♦ Notations used for writing a set ♦ Different methods of representing sets – Roaster method, Description method and set builder method	The students will be able to form a set, identify whether a collection is a set or not and will be able to write a set in different methods.	The students can be given an example of a collection and questioned whether it is a set or not. Worksheets based on writing a set can be done with the students	1) "All tall students of the class" is this a set? Give reasons. 2) "All even composite numbers less than 10" Write the above set in all 3 methods.
♦ Cardinal number of a set ♦ Types of sets (Finite, infinite, Singleton, empty, equal, Equivalent overlapping and disjoint sets)	The students will be able to find the cardinality of a set and will be able to identify the type of set.	♦ Worksheets based on cardinal number can be done. ♦ Give samples of sets and question the students whether they are equal or equivalent sets.	A = {1, 2, 3, 4, 5} B = {6, 7, 8, 9, 10} Are the sets equal or equivalent? Are the sets overlapping or disjoint?

Exercise 4.1

1. Which of the following are sets? Justify your answer.

Ans.

i) It is not a set because the quality of the student may different from person-to-person.

ii) It is a set because it is well defined.

iii) It is not a set because strength varies from ones point of view.

iv) It is a set because it is well defined.

v) It is a set because it is well defined.

vi) It is a set because it is well defined.

Hence, (ii), (iv), (v) and (vi) are sets while (i) and (iii) are hot sets.

2. Let A={11, 12, 13, 15, 18, 23, 31}. Insert the appropriate symbol Î or Ï in the blank spaces.

i) $15 \in A$ ii) $18 \in A$ iii) $10 \notin A$

iv) $24 \notin A$ v) $20 \in A$ vi) $23 \in A$

3. Write the following sets in Roster form.

i) A = {–1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18}

ii) c = {12, 21, 30}

iii) D = {3, 5, 9, 15, 1, 45}

iv) E = {E, L, P, H, A, N, T}

v) F = {7, 14, 21, 28, 35, 42, 49, 56}

4. Write the following sets in Description form.

i) S = {all even whole numbers <12}

ii) F = {all multiples of 4}

iii) Y = {a letter in he word 'History'}

iv) K = {all even natural numbers}

v) E = {months of a year having 30 days}

5. Write in set builder notation.

i) B = $\{x : x$ is a letter in the word 'MATH' $\}$

ii) A = $\{x : u\,n^2, n \leq 5$ and n $\in$ natural numbers$\}$

iii) C = $\{x : n = 2n, n \leq 5, n \in N\}$

iv) D = $\{x : x$ is a integer and $-3 < x < 3\}$

6. Write the cardinal numbers of the following sets.

i) B = {M, I, R, A, C, L, E}

n (B) = 7

ii) A = {P, R, E, T, Y}

n (A) = 5

iii) C = {10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 180, 190, 200}

n (C) = 20

iv) D = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11}

n (D) = 11

7. Which of the following sets are empty sets?

(i), (iii), and (iv) are empty sets.

8. Say whether the following sets are finite, infinite or empty.

i) The set of days of a week.

A = {Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday}

$\therefore$ Finite set

ii) {1, 2, 3, ...}

B = {1, 2, 3, ...}

$\therefore$ Infinite set

iii) The set of prime numbers less than 2.

C = { }

$\therefore$ Empty Set

iv) The set of numbers which are multiples of 10.

D = {10, 20, 30....}

$\therefore$ Infinite set

v) The set of natural numbers.

E = {1, 2, 3, 4, 5....}

$\therefore$ Infinite Set

vi) The set of points on a circle.

Infinite Set

9. State whether set A = set B or not.

i) A = {a, b, c, d}; B = {b, c , a, d}

$\therefore$ A = B

ii) A = {2, 4, 6, 8, 10}; B = {x : x is a positive integer and x < 11}

$\therefore$ A = B

iii) A = {x : x is a multiple of 5}; B = {15, 10, 15, 20 ...}

$\therefore$ A = B

10. From the sets given below select equal sets and equivalent sets.

A	=	{2, 14, 18, 10}	B	=	{11, 12, 8, 14}	C	=	{14, 18, 10, 12}
D	=	{8, 11, 14, 12}	E	=	{a, b}	F	=	{0, –1}
G	=	{b, a}	H	=	{0, 1}			

Equal sets = B and D, E and G

Equivalents sets = A, B, C, D and E, F, G, H

11. Use the sets below to answer the following questions.

i) Determine which of the sets are equal.

None of the above

ii) Determine which of the sets are equivalent.

B and C D and E

iii) Write the cardinal number of set B and set E.

n (B) = 4 n (E) = 3

12. Say whether the following pairs of sets are overlapping or disjoint.

i) A = {11, 13, 14, 15, 17}

B = {2, 15, 17, 18}

overlapping sets

ii) C = {a, b, c}

D = {a, b, c, d, e}

overlapping sets

iii) E = {set of all students who wear spectacles in std. 4}

F = {set of all students in std. 4}

overlapping sets

iv) G = {set of colours in the rainbow}

H = {black, white, grey}

disjoint sets

v) J = {set of odd natural numbers}
K = {set of natural numbers}
overlapping sets

13. State whether each of the following statement is true or false. Justify your answer.

i) {1, 3, 5, 7} and {3, 6} are disjoint sets.
False , 3 is overlapping

ii) {a, e, i, o, u} and {o, r, e, a, d} are overlapping sets.
True, because 9, e, 0 are common in the given sets.

iii) {2, 6, 10, 14} and {3, 7, 11, 15} are overlapping sets.
False because the given sets have no element in common.

iv) {2, 6, 10} and {3, 7, 11} are disjoint sets.
True because the given sets have no element in common.

SELF ASSESSMENT-4

1. Write in tabular form.

i) A = { set of all factors of 15}
A = {3, 5, 1, 15}

ii) B = {whole numbers less than 6}
B = {0, 1, 2, 3, 4, 5}

2. Write in set builder form.

i) C = { The first four multiples of 2 }
C = { $x : x = 4x \leq 16$ and it is a natural number}

ii) D = { the letters of the word 'TEACHER'}
D = {x : n}

3. Collection of all odd number less than 100 is a set. True or False.
True

4. Collection of all clean cities in India is a set. True or False.
False.

5. A = { 10, 20, 30, 40} then which of the following is not true?
(c) 50 ÎA

6. The number of natural satellites of Earth is a _____ set.
(b) singleton

7. A = { 1, 2, 3, 4} B= {2, 4, 6, 8} then A and B are
(c) both a and b

8. The prime factors of 6 in tabular form is
(b) {1, 2, 3, 6}

9. The letters of the word 'MADAM' in tabular form.
(b) {M,A,D}

10. A = { The letters of the words 'FLOWER'} B = { The letters of the word 'FOLLOWER'}. Then A and B are _____ set.
(c) both a and b

11. The cardinal number of {set of all factors of 24}.

(b) 8

12. _____ sets have same cardinal number.

(b) equivalent

13. If two sets have some common element then they are _____sets.

(a) overlapping

14. {Girls having naturally blue hair} is an example of _____set.

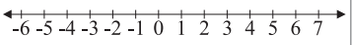
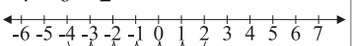
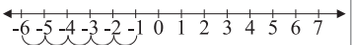
(b) null

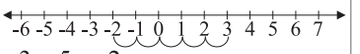
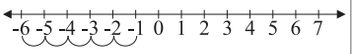
15. {The set of natural numbers} is a _____set.

(c) infinite

Chapter-5 Integers

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Integers: Introduction and used of integers in daily life Absolute value of integer	Children will be a ware of how the negative Integers are formed and what is the need of them? They will have the concept of absolute value of an integer	Introduce the integers in a simple way that they are the numbers to represent in the opposite direction. Show this idea by moving forward a number of steps from a fixed point 0 and move backward the same number of steps from 0, then the backward movement is represented by negative numbers. Hence the negative numbers represent the opposite statement. For egs. Increase In weight is represented by +ves and decrease In weight is represented by. -ves. Give more egs on integers in daily life and absolute value.	Write the following as + 1. Expense of ₹50 2. Decrease of temperature by 2°C Calculate|–3|+|–5

Integers on number line properties of integers comparison of integers	Children will be Able to draw a number line and represent integers on it. They will be able to arrange numbers in ascending/descending order and compare integers.	Recollect the idea of number line by discussing it with the children.  Make the children understand how to identify the position of a given integer by moving to the right and left of 0 Worksheet on comparison and arranging of integers can be done.	Use > , < or = 1. –25 ☐ 25 2. –25 ☐ –52 3. 1–15 ☐ 15
Addition of Integers On Number Line	Children will be Able to add two integers by using number line	Add two integers on number line by moving as many steps to the right side of the first number on the number line, If + ve is added and move in the opposite direction if - ve is added. -4 + 6 = 2   -1 + -5 = -6	Add using number line 1) –1 + –4 2) –2 + 6
General Rule of Addition of Integers	Children will be able to without using numbers line	Make the children understand how to use the rules of addition of integers i) If both integers are of the same sign then add the numbers and put the same sign ii) If both are having different sign take their difference and put the sign of the larger number. Worksheets can be done.	Solve: 1) –2 + –5 = 2) + 5 –2 =

Subtraction of Integers on Number Line	Children will be Able to subtract and integer from another Integer on a number line.	To subtract +ve move to the left and to subtract -ve move to the right from the first number.  3 – 5 = -2  -5 + (-6) = 1 Make the children understand how to subtract by doing worksheets.	Subtract using number line 1) –4 –(6) 2) 2 – 5
Introduction to Additive Inverse And General Rule of Subtraction	Children will be Able to subtract an integer from another integer without using number line.	Define additive inverse as the number obtained by changing the sign. To subtract an integer from another integer add the additive inverse of the second number by using the rules of addition. Worksheets to be done.	Solve. 1) –2 + (–5) = 2) –7 – (–2) =

Exercise 5.1

1. Write the opposite of the following.

i) 7 km south = 7km north

ii) withdrawal of ₹1000 = deposition of ₹1000

iii) up 3 floors = down 3 floors

iv) decrease of 2°C = increase of 2°C

2. Write the following using appropriate sign '+' or '–'.

i) Profit of ₹ 500 = +₹500

ii) Climbing up 100 m = + 100 m

iii) Deposit of ₹ 1000 = +₹1000

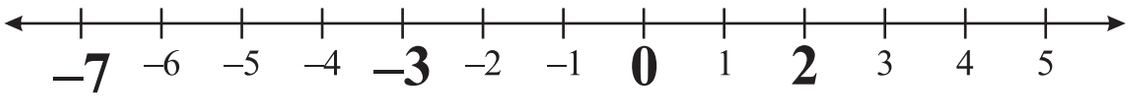
iv) 20° below 0°C = –20°

v) 70 m below sea level = –70m

vi) A withdrawal of ₹ 5000 = –₹5000

3. Plot the following integers on the number line.

i) 2 ii) -7 iii) 0 iv) –3



4. Put >, < or =.

i) -5 $\boxed{<}$ 5 ii) -6 $\boxed{<}$ 6 iii) -8 $\boxed{<}$ -3

iv) 5 $\boxed{<}$ 9 v) -3 $\boxed{<}$ 11 vi) -18 $\boxed{>}$ -24

5. Study the number line and answer the questions that follows.

i) Point greater than D — E (6) is a point greater than D.

ii) Points less than B — E (–7) and (1–5) are points less than B.

iii) Point 9 units greater than B — E (6) is a unit greater than B.

iv) Point 2 units less than C — F (–7) is 2 units less than C.

v) Point with no sign. — A (0) is a point with no sign.

6. Write all integers between.

i) 0 and 5 = 1, 2, 3, 4 ii) –7 and – 4 = –5, –6

iii) – 2 and 0 = –1 iv) – 4 and 4 = –3, –2, –1, 0, 1, 2, 3

v) – 10 and –6 = –7, –8, –9

7. Write the following.

i) 3 integers less that 15

ii) 4 integers greater than 29.

iii) 2 integers less than –40

iv) 5 negative integers greater that –12

8. Using number line answer the following as true or false.

i) –2 is to the right of –3 **True**

ii) –1 is to the left of –8 **False**

iii) +3 is to the right of 4 **False**

iv) + 4 is to the left 9 **True**

9. Write the absolute values of the following.

i) -8 = **8** ii) $-|-9|$ = **–9**

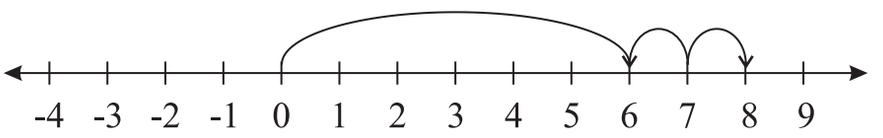
iii) $|18|$ = **18** iv) $|-350|$ = **350**

Exercise 5.2

1. Add using number line.

i) 6 and 2

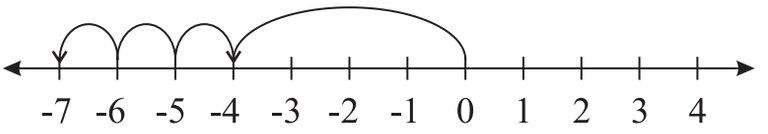
(6 + 2)



∴ **Ans.** 8

ii) –4 and –3

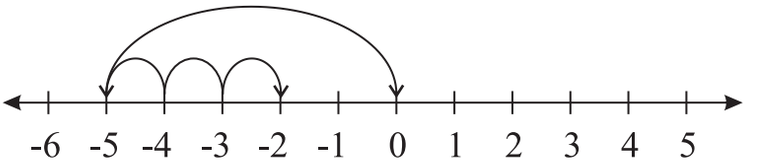
(–4 + –3)



∴ **Ans.** –7

iii) –5 and 3

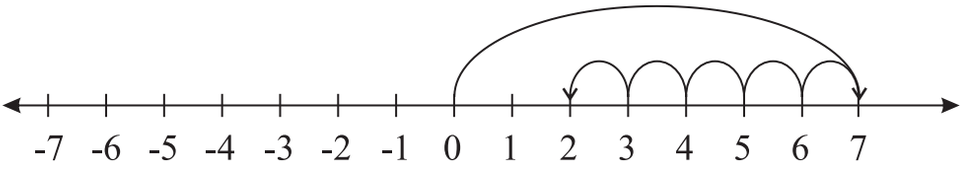
(–5 + 3)



∴ **Ans.** –2

iv) 7 and –5

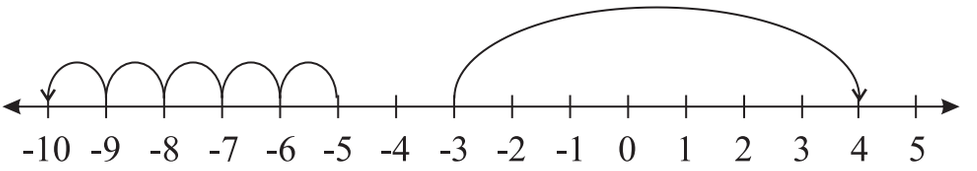
(7 + –5)



∴ **Ans.** –2

v) –6 and –5

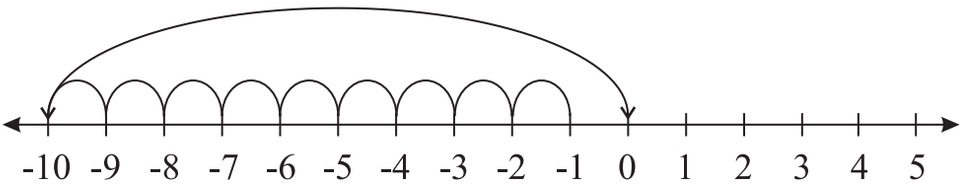
(–6 + –5)



∴ **Ans.** –2

vi) –10 and 8

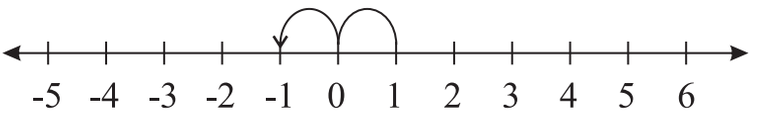
(–10 + 8)



∴ **Ans.** –2

2. Subtract using number line.

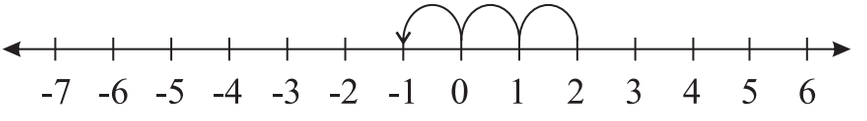
i) 2 from 1



∴ **Ans.** –2

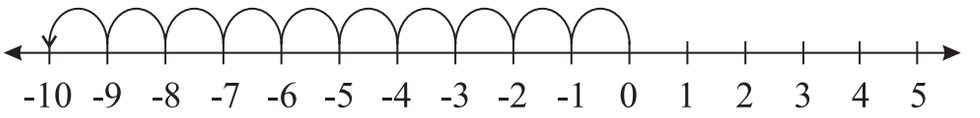
ii) –3 from –1

(–1 – (–3)



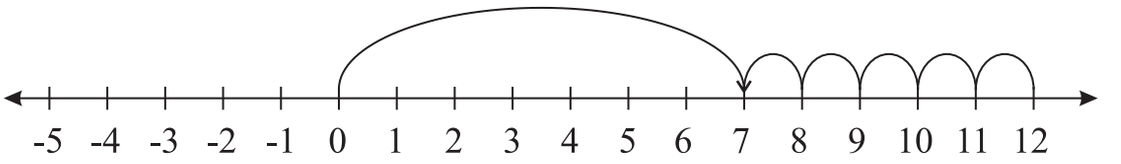
∴ **Ans.** –2

iii) 8 from –2
(–2 –8)



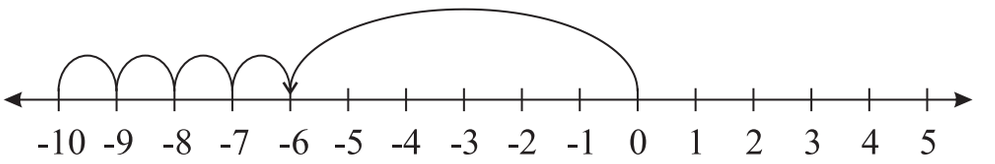
∴ **Ans.** –10

iv) –5 from 7
(7 – (–5))



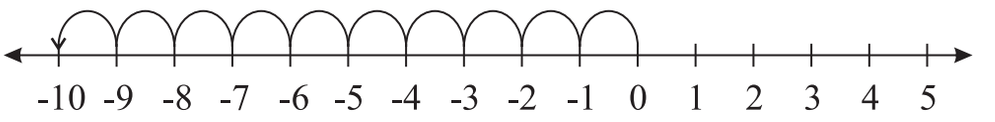
∴ **Ans.** –12

v) 4 from – 6
(–6 –4)



∴ **Ans.** –10

vi) 10 from 0
(10 – 10)



∴ **Ans.** –10

3. Add.

i) 18 + (–5)
= 18 – 5
= **13**

ii) –24 + (–10)
= –24 –10
= **–34**

iii) –50 + (–20)
= –50 – 20
= **–70**

iv) –12 + (–22)
= –12 – 22
= **–34**

v) 45 + (–13)
= 45 – 13
= **32**

vi) –90 + (–30)
= – 90 + (–30)
= **–120**

vii) –45 + 20
= **–25**

viii) –25 + 99
= **74**

4. Subtract.

i) 5 from 7
= 7 – 5
= **2**

ii) 8 from 5
= 5 – 8
= **–3**

iii) –11 from –10
= –10 – (–11)
= **–10 + 11**

iv) 20 from 18
= 18 – 20
= **–2**

v) 18 from 20
= 18 – 20
= **2**

vi) –14 from –24
= –24 – (–14)
= –24 + 14
= **–10**

vii) –6 from –10

$= -10-(-6)$

$= -10+6$

$= -4$

viii) –16 from –10

$= -10-(-16)$

$= -10+16$

$= 6$

5. The sum of two integers is –100. If one of the integers is – 64, find the other number.

$= -100-(-64)$

$= -100+64$

$= -36$

6. Add – 9 to the sum of –8 and 21.

$= -9+(-8+21)$

$= -9+13$

$= 4$

7. What must be subtracted from –29 to get 15?

$-29-15$

$= -44$

8. What will be the sum of the additive inverse of – 33 and –14?

Additive inverse of $-33 = 33$

Additive inverse of $-14 = 14$

$33+14$

$= 47$

$\therefore$ **Ans.** 47

9. Prove:

i) $-2-3 = -(2+3)$

L.H.S	R.H.S
$-2-3$	$-(2+3)$
$= -5$	$= -5$

$\therefore$ L.H.S = RHS

ii) $10-2-4 = 10-4-2$

L.H.S	R.H.S
$10-2-4$	$10-4-2$
$= 10-(2+4)$	$= 10-(4+2)$
$= 10-6$	$= 10-6$
$= 4$	$= 4$

$\therefore$ L.H.S = RHS

10. Prove that the sum of additive inverse of –10 and 10 is zero?

Additive inverse of $-10 = 10$

Additive inverse of $10 = -10$

$\therefore 10+(-10)$

$= 10-10$

$= 0$

SELF ASSESSMENT-5

1. Write the absolute value of:

   i) –6

   The absolute value of –6 is **6**

   ii) 10

   The absolute value of 10 is **10**

   iii) 0

   The absolute value of 0 is **0**

   iv) –29

   The absolute value of –29 is **29**

2. **Find:**

   i) 6 more than –10

   –4 (–10 + 6 = –4)

   ii) 5 less than –2

   –7 (–2 – 5 = –7)

   iii) 4 more than 18

   22 (18 + 4 = 22)

   iv) –7 less than 3

   10 (3 – (–7) = 10)

3. **Write 3 consecutive even integers less than –10.**

   –12, –14, –16 (3 consecutive even integers less than –10)

4. **Simplify:**

   i) –16 + 30 + (–5)

   = –16 + 30 – 5

   = 30 – (16 + 5)

   = 30 – 21

   = **9**

   ii) 18 – (–5) + (–3)

   = 18 + 5 – 3

   = 23 – 3

   = **20**

5. **Subtract:**

   i) –39 from 45

   = 45 – (–39)

   = 45 + 39

   = 84

   ii) 6 from –29

   = –29 – 6

   = –35

6. **The additive inverse of –17 is**

   (d) 17

7. **–15 is _____ 15.**

   (b) less than

8. **The sum of two integers is –10. If one of them is –18, the other is**

   (a) 8 – 10 – (–18)

   = –10 + 18

   = 8

9. **When you add two negative integers you always get**

   (a) negative integers

10. **The only integer that has no sign**

    (a) 0

11. The additive inverse of 5 added to the additive inverse of –4 is

(b) –1 additive inverse of 5 = –5

additive inverse of –4 = 4

$\therefore -5+4$

$= \mathbf{-1}$

12. The greatest integer among –8, –7, –6, –31 is

(c) –6 is the greatest

13. Deposit of ` 2500 is written as

(a) +₹2500

14. |–9| + |–5| = ?

(d) 14 **|–9| + |–5|**

$= 9+5$

$= \mathbf{14}$

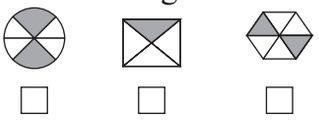
15. What must be subtracted from –15 to get –29?

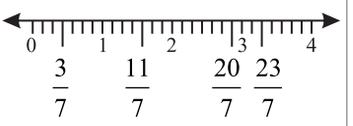
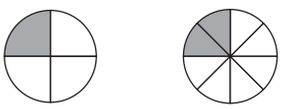
(b) 14 $15 - \text{No} = -29$

$-15+29 = \text{No}$

$= \mathbf{14}$

Chapter-6 Fraction

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Introduction : Fractions	Understand the concept of a fraction as the part of a whole.	Define fraction as the part of a whole. Representation of a fraction in the from $\frac{a}{b}$ where a is called numerator and b is called denominator. Show the diagrammatic representation of fractions through egs.  It represent $\frac{1}{4}$ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ It represent $\frac{4}{9}$	Write the fractions for the following.  □ □ □

Fraction on A number Line	Understand the representation of fractions on a number line	Explain the method of representation of fractions on the number line by drawing it.  	Represent $3\frac{4}{5}$ on the number line
Types of Fractions And Their Conversions	Understand the different types of fractions as proper, Improper and mixed fractions Able to convert one from to another.	N'<'⇒ proper fraction. Egs. $\frac{1}{2},\frac{3}{5},\frac{99}{100},....$ N'<'⇒ Improper fraction Egs. $\frac{5}{2},\frac{23}{21},\frac{50}{35},....$ The combination of a whole number and a proper fraction is called mixed fraction. Egs. $1\frac{1}{2},3\frac{2}{7},....$ $\frac{25}{5}=4\frac{1}{6}$ $6\overline{)25}$ 4, 24, 1 $4\frac{1}{6}=\frac{6\times4+1}{6}=\frac{25}{6}$ Make the children understand the conversions by doing more problems.	Is $\frac{17}{5}$ a proper fraction. Give reasons. If no can it be converted to a mixed fraction?
Equivalent Fractions And Simplest Form of Fractions	Understand the meaning of equivalent fractions. Students will be able to reduce a fraction to its simplest form.	Demonstrate the equivalent fractions by taking different examples. Worksheets based on reducing a fraction to simplest form can be done.	1) Are the given fractions equivalent?  2) $\frac{6}{10}=\frac{\boxed{?}}{20}$

Like and Unlike fractions Comparison of fractions and ordering of fractions.	Students will be able to distinguish between the like and unlike fraction and apply them to compare two fractions	Explain to the students comparison of like (fractions and comparison of unlike fractions make the denominators equal and by using LCM and compare) Worksheet based on comparison and ordering can be done.	1) Is $\frac{2}{7}$ greater than $\frac{1}{6}$ 2) Use >, < or = $\Rightarrow \frac{2}{7}\square\frac{1}{7}$ $\Rightarrow \frac{1}{8}\square\frac{6}{12}$
Addition and Subtraction of fractions	Students will be able to add and subtract fractions	Explain the method of adding like fraction and unlike fractions. Oiagrams of fractions can be used 70 show addition and subtraction of fractions.	Solve: 1) $\frac{1}{6}+\frac{2}{6}=\square$ 2) $\frac{6}{7}+\frac{8}{6}$ $=\frac{\square+\square}{42}$ $=\square$
Multiplication and Division of fractions Reciprocal of a fraction	Students will be able to multiply and divide fractions	Explain to the children how to multiply fractions use egs show multiplication of fraction by a whole number, by a fraction, by 1 and by 0. Explain the concept of reciprocal and explain division Worksheets can be done.	1) What is the reciprocal of $\frac{1}{6}\times\frac{3}{7}$? 2) Solve: $\frac{1}{8}\div\frac{1}{16}=\square$

Exercise 6.1

1. Represent the following fractions in words.

i) $\frac{2}{7}$ Two – seventh

ii) $\frac{9}{11}$ Nine – eleventh

iii) $\frac{5}{8}$ Five – eighth

iv) $\frac{1}{3}$ One – third

2. Write the following fraction in number form.

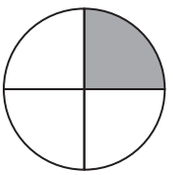
i) $\frac{1}{10}$ one-tenth

ii) $\frac{4}{11}$ four-eleventh

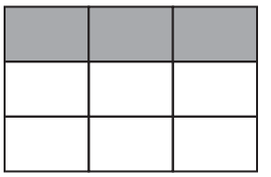
iii) $\frac{3}{14}$ three-fourteenth

iv) $\frac{6}{19}$ six-nineteenth

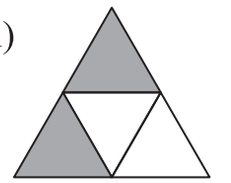
3. What fraction is represented by the shaded portion in the following figure.

i) 

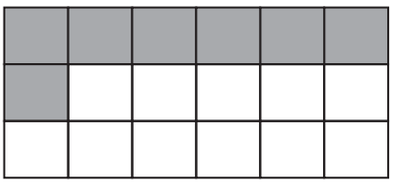
$\frac{1}{4}$

ii) 

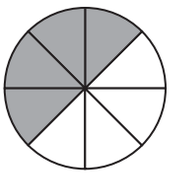
$\frac{\cancel{3}}{\cancel{9}}\ \frac{1}{3}$

iii) 

$\frac{\cancel{2}}{\cancel{4}}\ \frac{1}{2}$

iv) 

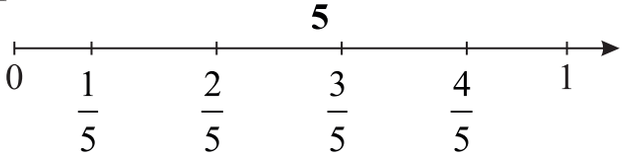
$\frac{7}{18}$

v) 

$\frac{\cancel{4}}{\cancel{8}}\ \frac{1}{2}$

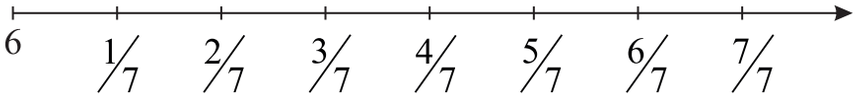
Exercise 6.2

1. Represent the fraction $\frac{2}{5}$ on the number line.

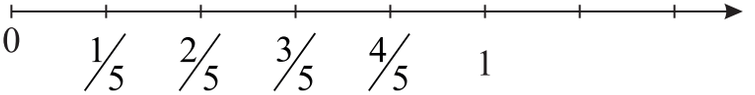
i) 

2. Show

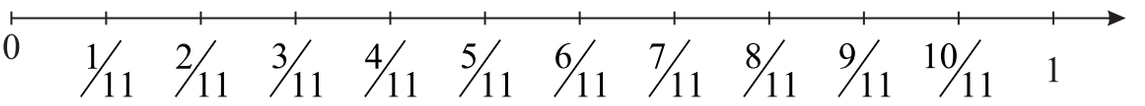
i) $\frac{1}{4}, \frac{2}{7}, \frac{5}{7}$ and $\frac{6}{7}$ on a number line.



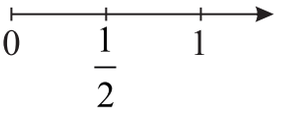
3. Represent the following fractions on the number line.

i) $\frac{3}{5}$ 

ii) $\frac{2}{11}$



iii) $\frac{1}{2}$



Exercise 6.3

1. Classify as proper, improper and mixed fraction.

i) $5\frac{1}{4}$ Mixed fraction

ii) $\frac{9}{8}$ Improper fraction

iii) $3\frac{2}{3}$ Mixed fraction

iv) $\frac{6}{7}$ Proper fraction

v) $\frac{8}{13}$ Mixed fraction

vi) $5\frac{9}{9}$ Mixed fraction

vii) $\frac{11}{9}$ Improper fraction

2. Convert the following improper fractions to mixed fractions.

i) $\frac{6}{4}$ $1\frac{2}{4}$

ii) $\frac{9}{7}$ $1\frac{2}{7}$

iii) $\frac{13}{4}$ $3\frac{1}{4}$

iv) $\frac{22}{9}$ $2\frac{4}{9}$

3. Convert the following improper fractions to mixed fractions.

i) $2\frac{1}{3}$ $\frac{7}{3}$

ii) $6\frac{7}{5}$ $\frac{37}{5}$

iii) $11\frac{2}{9}$ $\frac{101}{9}$

iv) $7\frac{1}{8}$ $\frac{57}{8}$

Exercise 6.4

1. Write 3 equivalent fractions for each.

i) $\frac{1}{7} \Rightarrow \frac{2}{14}, \frac{3}{21}, \frac{4}{28}$

ii) $\frac{6}{11} \Rightarrow \frac{12}{22}, \frac{18}{33}, \frac{24}{44}$

iii) $\frac{5}{13} \Rightarrow \frac{10}{26}, \frac{20}{52}, \frac{15}{39}$

2. Write a fraction equivalent to $\frac{\mathbf{12}}{\mathbf{30}}$ with:

i) numerator 2 $\frac{2}{7}$

ii) denominator 60 $\frac{24}{60}$

iii) numerator 60 $\frac{60}{150}$

iv) denominator 10 $\frac{4}{10}$

v) numerator 36 $\frac{36}{90}$

vi) denominator 15 $\frac{6}{15}$

3. Write the missing number so that the fractions are equivalent fractions.

i) $\frac{2}{3} = \frac{4}{\boxed{6}}$ ii) $\frac{8}{9} = \frac{64}{\boxed{72}}$ iii) $\frac{11}{10} = \frac{\boxed{110}}{100}$

iv) $\frac{5}{7} = \frac{\boxed{40}}{56}$ v) $\frac{2}{3} = \frac{\boxed{10}}{65}$ vi) $\frac{4}{15} = \frac{\boxed{16}}{60}$

4. Verify if the following fractions are equivalent.

i) $\frac{2}{7}$ and $\frac{3}{8}$ **Not equivalent** ii) $\frac{1}{3}$ and $\frac{5}{8}$ **Not equivalent**

iii) $\frac{5}{12}$ and $\frac{15}{36}$ **Equivalent** iv) $\frac{6}{7}$ and $\frac{18}{21}$ **Equivalent**

v) $\frac{3}{5}$ and $\frac{21}{35}$ **Equivalent** vi) $\frac{10}{17}$ and $\frac{20}{34}$ **Equivalent**

5. Reduce the fraction to it simplest form.

i) $\frac{\cancel{20}}{\cancel{38}}\ \frac{10}{19}$ ii) $\frac{\cancel{120}}{\cancel{240}}\ \frac{1}{2}$ iii) $\frac{1\cancel{25}}{2\cancel{00}}\ \frac{2\cancel{5}}{4\cancel{0}}\ \frac{5}{8}$

iv) $\frac{\cancel{24}}{\cancel{36}}\ \frac{2}{3}$ v) $\frac{\cancel{75}}{\cancel{60}}\ \frac{\cancel{15}}{\cancel{12}}\ \frac{5}{4}$ vi) $\frac{\cancel{100}}{\cancel{150}}\ \frac{2}{3}$

6. Classify the fractions as like or unlike fraction.

i) $\frac{2}{7}, \frac{3}{7}, \frac{5}{7}$ **Like fractions** ii) $\frac{1}{8}, \frac{2}{18}, \frac{3}{9}$ **Unlike fraction**

iii) $\frac{5}{9}, \frac{5}{11}, \frac{5}{7}$ **Unlike fraction** iv) $\frac{2}{11}, \frac{6}{11}, \frac{9}{11}$ **Like fractions**

7. Convert the following unlike fractions to like fractions.

i) $\frac{1}{7}, \frac{2}{3}, \frac{1}{14}$

L.C.M = 42

$\frac{1}{7} \times 6 = \frac{6}{42}$

$\frac{2}{3} \times 14 = \frac{88}{42}$

$\frac{1}{14} \times 3 = \frac{3}{42}$

$\therefore \frac{6}{42}, \frac{28}{42}, \frac{3}{42}$

ii) $\frac{3}{5}, \frac{2}{10}, \frac{6}{20}$

L.C.M = 42

$\frac{3}{5} \times 4 = \frac{12}{20}$

$\frac{2}{10} \times 2 = \frac{4}{20}$

$\frac{6}{20} \times 1 = \frac{6}{20}$

$\therefore \frac{12}{20}, \frac{4}{20}, \frac{6}{20}$

iii) $\frac{3}{8}, \frac{5}{16}, \frac{3}{4}$

L.C.M = 16

$\frac{3}{8} \times 2 = \frac{6}{16}$

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

$\frac{3}{4} \times 4 = \frac{12}{16}$

$\therefore \frac{6}{16}, \frac{5}{16}, \frac{12}{16}$

iv) $\frac{1}{3}, \frac{3}{4}, \frac{7}{16}$

L.C.M = 48

$\frac{1}{3} \times 16 = \frac{16}{48}$

$\frac{3}{4} \times 12 = \frac{36}{48}$

$\frac{7}{16} \times 3 = \frac{21}{48}$

$\therefore \frac{16}{48}, \frac{36}{48}, \frac{21}{48}$

v) $\frac{5}{6}, \frac{1}{12}, \frac{2}{3}$

L.C.M = 12

$\frac{5}{6} \times 2 = \frac{10}{12}$

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

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

vi) $\frac{7}{10}, \frac{8}{5}, \frac{3}{10}$

L.C.M = 10

$\frac{7}{10} \times 1 = \frac{7}{10}$

$\frac{8}{5} \times 2 = \frac{16}{10}$

$\frac{3}{10} \times 1 = \frac{3}{10}$

$\therefore \frac{7}{10}, \frac{16}{10}, \frac{3}{10}$

Exercise 6.5

1. Compare:

i) $\frac{2}{5} \boxed{<} \frac{3}{5}$

ii) $\frac{7}{9} \boxed{>} \frac{8}{18}$

$= \frac{14}{18} \boxed{>} \frac{8}{18}$

iii) $5\frac{1}{4} \boxed{<} 6\frac{1}{4}$

$= \frac{10}{4} \boxed{<} \frac{25}{4}$

iv) $7\frac{1}{8} \boxed{\ } 3\frac{1}{6}$

$= \frac{57}{8} \boxed{>} \frac{19}{6}$

$= \frac{171}{24} \boxed{>} \frac{76}{24}$

v) $\frac{8}{11} \boxed{\ } \frac{7}{11}$

vi) $\frac{7}{9} \boxed{\ } \frac{5}{8}$

$= \frac{56}{72} \boxed{>} \frac{45}{72}$

2. Arrange the following fractions in ascending order.

i) $\frac{7}{9}, \frac{6}{9}, \frac{11}{9}$

Ans. order : $\frac{6}{9}, \frac{7}{9}, \frac{11}{9}$

ii) $\frac{1}{4}, \frac{3}{4}, \frac{2}{4}$

Ans. order: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}$

iii) $5\frac{1}{8}, 6\frac{2}{8}, 3\frac{7}{8}$

$= \frac{41}{8}, \frac{50}{8}, \frac{31}{8}$

Ans. order: $\frac{31}{8}, \frac{41}{8}, \frac{50}{8}$

iv) $\frac{5}{6}, \frac{1}{4}, \frac{3}{2}$

$= \frac{10}{12}, \frac{3}{12}, \frac{18}{12}$

Ans. order: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}$

$= \frac{3}{12}, \frac{10}{12}, \frac{18}{12}$

$= \frac{1}{4}, \frac{5}{6}, \frac{3}{7}$

v) $\frac{9}{10}, \frac{2}{5}, \frac{6}{20}$

$= \frac{18}{20}, \frac{8}{20}, \frac{6}{20}$

Asc. order : $\frac{6}{20}, \frac{8}{20}, \frac{18}{20}$

$= \frac{6}{20}, \frac{2}{5}, \frac{9}{10}$

vi) $2\frac{1}{4}, 3\frac{1}{8}, 1\frac{1}{2}$

$= \frac{9}{4}, \frac{25}{4}, \frac{3}{2}$

$= \frac{18}{8}, \frac{25}{8}, \frac{12}{8}$

Asc order : $\frac{12}{8}, \frac{18}{8}, \frac{25}{8}$

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

3. Arrange the following fractions in descending order.

i) $\frac{2}{11}, \frac{3}{11}, \frac{9}{11}$

Desc. order : $\frac{9}{11}, \frac{3}{11}, \frac{2}{11}$

ii) $\frac{1}{6}, \frac{7}{6}, \frac{3}{6}$

Desc. order : $\frac{7}{6}, \frac{3}{6}, \frac{1}{6}$

iii) $2\frac{1}{7}, 5\frac{1}{7}, 8\frac{2}{7}$

$2\frac{1}{7}, 5\frac{1}{7}, 8\frac{2}{7}$

$= \frac{15}{7}, \frac{36}{7}, \frac{15}{7}$

Desc order : $\frac{58}{7}, \frac{36}{7}, \frac{15}{7}$

$= 84\frac{2}{7}, 5\frac{1}{7}, 2\frac{1}{7}$

iv) $\frac{6}{13}, \frac{5}{26}, \frac{1}{13}$

$= \frac{12}{26}, \frac{5}{26}, \frac{2}{26}$

Desc.order: $\frac{12}{26}, \frac{5}{26}, \frac{2}{26}$

$= \frac{6}{13}, \frac{5}{26}, \frac{1}{3}$

v) $\frac{2}{15}, \frac{7}{30}, \frac{3}{5}$

$= \frac{4}{30}, \frac{7}{30}, \frac{18}{30}$

Desc. order: $\frac{18}{30}, \frac{7}{30}, \frac{4}{30}$

$= \frac{3}{5}, \frac{7}{30}, \frac{2}{15}$

vi) $5\frac{1}{3}, 2\frac{1}{6}, 7\frac{1}{4}$

$= \frac{16}{3}, 2\frac{1}{6}, 7\frac{1}{4}$

$= \frac{64}{12}, \frac{26}{12}, \frac{87}{12}$

Desc. order : $\frac{87}{12}, \frac{64}{12}, \frac{26}{12}$

$7\frac{1}{4}, 5\frac{1}{3}, 2\frac{1}{6}$

Exercise 6.7

1. Sumit ran $\frac{2}{3}$ km and Shagun ran $3\frac{1}{5}$ km. Find the difference in the distance that they ran.

Distance covered by Sumit $= \frac{2}{3}$ km

Distance covered by Shagun $= 3\frac{1}{5}$ km or $\frac{16}{5}$ km

$\therefore$ Difference between distance covered $= \frac{16}{5} - \frac{2}{3}$

$= \frac{48-10}{15}$

$= \frac{38}{15} = 2\frac{8}{15}$

$\therefore$ **Ans.** $2\frac{8}{15}$ km.

2. Belly and her son went fishing. Belly caught $3\frac{3}{5}$ kg of fish while her son caught $2\frac{1}{5}$ kg of fish. What is the total weight of the fishes that they caught?

No. of fishes caught by Belly $= 3\frac{3}{4}\text{kg} = \frac{15}{4}\text{kg}$

No. of fishes caught by her son $= 2\frac{1}{5}\text{kg} = \frac{11}{5}\text{kg}$

$\therefore$ Total no of fishes caught $= \frac{15}{4}+\frac{11}{5}$

$= \frac{78+44}{20}$

$= \frac{119}{20}=5\frac{19}{20}$

$\therefore$ **Ans.** $5\frac{19}{20}$ kg fishes

3. For the annual concert day, a group of students prepared $21\frac{1}{2}$ litres of lemonade. At the end of the day, they had $2\frac{5}{8}$ litres left over. How many litres of lemonades were sold?

Litres of lemondade prepared $= 21\frac{1}{2}\text{litres} = \frac{43}{2}l$

Litres of lemonde left $= 2\frac{5}{8}\text{litres} = \frac{21}{8}l$

$\therefore$ Litres of lemonde sold $= \frac{43}{2}-\frac{21}{8}$

$= \frac{172-21}{8}$

$= \frac{151}{8}=18\frac{7}{8}$

$\therefore$ **Ans.** $18\frac{7}{8}$ litres.

4. Dolly spent $2\frac{1}{2}$ hours on her laptop on Monday. On Tuesday, she spent $1\frac{3}{5}$ hours on it. Find the total amount of time, in hours, that Dolly spent on her laptop.

Time spent on laptop on Monday $= 2\frac{1}{2}\text{ hours} = \frac{5}{2}\text{ hours}$

Time spent on laptop on Tuesday $= 1\frac{3}{5}\text{ hours} = \frac{8}{5}\text{ hours}$

$\therefore$ Total time spent $= \frac{5}{2}+\frac{8}{5}\text{ hours}$

$= \frac{25+16}{10}$

$= \frac{41}{10} = 4\frac{1}{10}$

$\therefore$ **Ans.** $4\frac{1}{10}\text{ hours}$

5. A farmer has a bamboo pole that was $6\frac{3}{4}$ m long. He cut off $1\frac{1}{4}$ m and another $2\frac{1}{3}$ m. What is the length of the remaining bamboo pole in m?

Length of the bamboo pole $= 6\frac{3}{4}\text{m} = \frac{27}{4}\text{m}$

Length of the pole cut off $= 1\frac{1}{4}\text{m} + 2\frac{1}{3}$

$= \frac{5}{4}+\frac{7}{3}$

$= \frac{15+28}{12}$

$= \frac{43}{12}\text{m}$

$\therefore$ Length of the remaining bamboo pole $= \frac{27}{4}-\frac{43}{12}$

$= \frac{81-43}{12}$

$= \frac{\cancel{33}^{19}}{\cancel{12}_{6}} = \frac{19}{6} = 3\frac{1}{6}$

$\therefore$ **Ans.** $3\frac{1}{6}\text{m}$

6. Nancy bought $2\frac{3}{4}$ kg of fruits, $1\frac{1}{4}$ kg of fish and $2\frac{1}{3}$ kg of curd. What is the total mass, in kg, of the items that she bought?

Amt. of fruits bought $= 2\frac{3}{4}\text{kg} = \frac{11}{4}\text{kg}$

Amt. of fish bought $= 1\frac{1}{4}\text{kg} = \frac{5}{4}\text{kg}$

Amt. of curd bought $= 2\frac{1}{3}\text{kg} = \frac{7}{3}\text{kg}$

$$= \frac{33+15+28}{12}$$

$$= \frac{\cancel{76}^{38}_{19}}{\cancel{12}^{6}_{3}} = \frac{19}{3} = 6\frac{1}{3}$$

$\therefore$ **Ans.** $6\frac{1}{3}\text{kg}$

7. Kimy has $3\frac{1}{2}$ bottles of milk in her refrigerator. She used $\frac{3}{5}$ bottle in the morning and $\frac{3}{5}$ bottle in the afternoon. How many bottles of milk does Kimy have left over?

No. of bottles of milk kimy has $= 3\frac{1}{2} = \frac{7}{2}\text{bottles}$

No. of bottles of milk used $= \frac{3}{5} + 1\frac{1}{4}$

$$= \frac{12+25}{20}$$

$$= \frac{37}{20}$$

No. of bottles of left $= \frac{1}{2} - \frac{37}{20}$

$$= \frac{70-37}{20}$$

$$= \frac{33}{20} = 1\frac{13}{20}$$

$\therefore$ **Ans.** $1\frac{13}{20}$ milk bottles.

8. A tank has $8\frac{3}{4}$ litres of water. $2\frac{4}{5}$ litres were used and the tank was filled with another $1\frac{1}{4}$ litres. What is the final volume of water in the tank?

Litres of water in the tank = $8\frac{3}{4}$ litres = $\frac{35}{4}l$

Litre of water added to the tank = $1\frac{1}{4}litres = \frac{5}{4}l$

$\therefore$ Litres of water in the tank = $\frac{35-5}{4}$

= $\frac{\cancel{40}}{\cancel{4}1}10l$

Litres of water used = $2\frac{4}{5}$ litres = $\frac{14}{5}l$

$\therefore$ Final valume of water = $10 - \frac{14}{5}$

= $\frac{50-14}{5}$

= $\frac{36}{5} = 7\frac{1}{5}$

$\therefore$ **Ans.** $7\frac{1}{5}$ litres.

Exercise 6.7

1. Evaluate the following.

i) $\frac{2}{7}\times\frac{3}{14}$

$= \frac{3}{49} = 16\frac{1}{49}$

ii) $\frac{2}{6}\times 2$

$= \frac{2}{3}$

iii) $7\frac{1}{2}\times 3$

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

$= \frac{45}{2} = 22\frac{1}{5}$

iv) $1\frac{1}{2}\times 12\frac{4}{5}$

$= \frac{3}{\cancel{2}_1}\times\frac{\cancel{64}^{12}}{5}$

$= \frac{96}{5} = 19\frac{1}{5}$

v) $8\frac{1}{4}\times 3\frac{1}{11}$

$= \frac{\cancel{33}3}{\cancel{4}_2}\times\frac{\cancel{34}^{17}}{\cancel{11}1}$

$= \frac{51}{2} = 25\frac{1}{2}$

vi) $4\frac{4}{5}\times 4\frac{1}{4}$

$= \frac{2\cancel{4}^{6}}{5}\times\frac{17}{\cancel{4}_1}$

$= \frac{102}{5} = 20\frac{2}{5}$

vii) $4\frac{4}{5}\times 1\frac{3}{12}$

$= \frac{\cancel{24}2}{\cancel{5}_1}$

$= 6$

viii) $6\frac{1}{10}\times 12\frac{1}{2}$

$= \frac{61}{\cancel{10}_2}\times\frac{\cancel{23}^{3}}{2}$

$= \frac{305}{4} = 76\frac{1}{4}$

2. Find the reciprocal of the following.

i) $\frac{3}{5}$ ii) 8 iii) $\frac{13}{7}$ iv) $2\frac{3}{8}$

$\frac{5}{3}$ $\frac{1}{8}$ $\frac{7}{13}$ $\frac{19}{8} \Rightarrow \frac{8}{19}$

3. Evaluate the following.

i) $\frac{7}{21} \div 14$

$= \frac{\cancel{7}^{1}}{21} \times \frac{1}{\cancel{14}_{2}}$

$= \frac{1}{42}$

ii) $\frac{4}{9} \div 40$

$= \frac{\cancel{4}^{1}}{9} \times \frac{1}{\cancel{40}_{10}}$

$= \frac{1}{90}$

iii) $5\frac{1}{4} \div \frac{7}{8}$

$= \frac{\cancel{21}^{3}}{\cancel{4}_{1}} \times \frac{\cancel{8}^{2}}{7_{1}}$

$= 6$

iv) $5\frac{1}{3} \div 1\frac{1}{4}$

$= \frac{16}{3} \div \frac{5}{4}$

$= \frac{16}{3} \times \frac{4}{5}$

$= \frac{64}{15} = 4\frac{4}{15}$

v) $\frac{21}{20} \div \frac{7}{5}$

$= \frac{21}{\cancel{20}^{4}} \times \frac{\cancel{5}^{1}}{7}$

$= \frac{21}{28}$

vi) $\frac{2}{9} \div \frac{1}{81}$

$\frac{2}{9} \div \frac{1}{81}$

$\frac{2}{\cancel{9}1} \times \frac{\cancel{81}^{9}}{1}$

$= 18$

vii) $10\frac{1}{2} \div 1\frac{7}{9}$

$= \frac{21}{2} \div \frac{16}{9}$

$= \frac{21}{2} \times \frac{9}{16}$

$= \frac{189}{32} = 5\frac{29}{32}$

(viii) $2 \div \frac{1}{3}$

$= \frac{2}{1} \div \frac{3}{1}$

$= 6$

4. What should be $\frac{1}{6}$ multiplied with to get $\frac{23}{48}$ as the product?

$\frac{23}{48} \div \frac{1}{6}$

$= \frac{23}{\cancel{48}_{8}} \times \frac{\cancel{6}^{1}}{1}$

$= \frac{23}{8} = 2\frac{7}{7}$

5. The product of two fractions is $\frac{9}{13}$. If one fraction is $\frac{27}{52}$, find the other fraction.

$\frac{9}{13} \div \frac{27}{52}$

$= \frac{9}{13} \times \frac{\cancel{52}^{4}}{\cancel{27}_{3}}$

$= \frac{4}{3}$

6. Simplify:

i) $\frac{2}{9} \times \frac{1}{4} \div \frac{18}{33}$

$= \frac{2}{9} \times \frac{1}{4} \div \frac{18}{33}$

$= \frac{11}{108}$

ii) $\frac{17}{32} \div \frac{15}{16} \times \frac{5}{9}$

$= \frac{17}{32_{\,8\,2}} \times \frac{\cancel{16}^{\,4}}{\cancel{15}_{\,3}} \times \frac{\cancel{5}1}{9}$

$= \frac{17}{54}$

iii) $\frac{3}{8} \times \frac{16}{11} \times 0$

$= \frac{3}{\cancel{8}_{\,1}} \times \frac{\cancel{16}^{\,2}}{11} \times 0$

$= \frac{6}{11} \times 0$

$= 0$

iv) $\frac{3}{5} \times \frac{10}{9} \times \frac{18}{11} \div 27$

$= \frac{\cancel{3}1}{\cancel{5}1} \times \frac{\cancel{10}^{\,2}}{\cancel{9}1} \times \frac{\cancel{18}^{\,2}}{11} \times \frac{1}{\cancel{27}_{\,9}}$

$= \frac{4}{99}$

7. What should $\frac{5}{6}$ be divided by to get the quotient as $\frac{17}{24}$?

$\frac{5}{6} \div x = \frac{17}{24}$

$x = \frac{17}{24} \times \frac{5}{6}$

$= \frac{85}{144}$

8. $\frac{1}{11}$ of a fraction is $2\frac{7}{66}$ Find the fraction.

$2\frac{7}{66} \div \frac{1}{11}$

$= \frac{139}{\cancel{66}_{\,6}} \times \frac{\cancel{11}^{\,1}}{1}$

$= \frac{139}{6} = 23\frac{1}{6}$

9. Prove:

i) $\frac{2}{5} \div \frac{3}{2} \div \frac{1}{6} = \frac{16}{10}$

$= \frac{2}{5} \times \frac{2}{3} \div \frac{1}{6} = \frac{16}{10}$

$= \frac{4}{\cancel{15}_{5}} \times \frac{\cancel{6}^{2}}{1} = \frac{16}{10}$

$= \frac{8}{5} = \frac{16}{10}$

As, $\frac{8}{5}$ and $\frac{16}{10}$ are equivalent fractions

hence the above statements is proved.

ii) $\frac{1}{4} \times \frac{1}{8} = \frac{1}{2} \div 16$

$= \frac{1}{4} \times \frac{1}{8} = \frac{1}{3} \times \frac{1}{16}$

$= \frac{1}{32} = \frac{1}{32}$

Hence proved.

SELF ASSESSMENT-6

1. Express as improper fractions.

(i) $1\frac{6}{11} = \frac{17}{11}$ (ii) $5\frac{2}{3} = \frac{17}{3}$ (iii) $10\frac{2}{7} = \frac{72}{7}$ (iv) $1\frac{1}{19} = \frac{20}{19}$

2. Express as mixed fractions.

(i) $\frac{18}{5} = 3\frac{3}{5}$ (ii) $\frac{40}{21} = 1\frac{19}{21}$ (iii) $\frac{19}{2} = 9\frac{1}{2}$ (iv) $\frac{61}{7} = 8\frac{5}{7}$

3. Find the difference of $\frac{5}{16}$ and $\frac{1}{12}$.

$\frac{5}{16} - \frac{1}{12}$

$\frac{15-4}{48}$

$= \frac{11}{48}$.

4. Out of 90 pages, I read 15 pages. What fraction of pages is left to be read?

$90 - 15$

$= 75$ pages

$\therefore$ Fraction $= \frac{\cancel{75}^{15}5}{\cancel{90}_{18_6}} = \frac{5}{6}$

5. Tina has $2\frac{2}{3}$ m of ribbon. She cut $1\frac{1}{6}$. What fraction is left with her?

$2\frac{2}{3} - 1\frac{1}{6}$

$= \frac{8}{3} - \frac{7}{6}$

$= \frac{\cancel{9}}{0}\frac{3}{2}$

6. The fraction $\frac{15}{45}$ in the simplest form:

(ii) $\frac{15}{\cancel{45}}\ \frac{1}{3}$

7. $\frac{4}{7}, \frac{2}{7}, \frac{3}{7}$ **are** _____ **fractions.**

(i) like

8. On the number line which fraction is closer to zero?

(i) $\frac{1}{5}$

9. $\frac{3}{4} \square \frac{3}{8}$ **Insert the proper sign.**

(ii) >

10. Out of 3 dozen banana, 2 dozens were sold. The fraction of bananas sold is

(ii) $\frac{2}{3}$

11. Find the product of $2\frac{1}{2}$ **and 3.**

$$2\frac{1}{2} \times 3$$
$$= \frac{5}{2} \times 3$$
$$= \frac{15}{2}$$

12. $\frac{1}{4}$ **divided by what gives** $\frac{1}{52}$**.**

$$\frac{1}{4} \div \frac{1}{52}$$
$$= \frac{1}{\cancel{4}_{\cancel{2}_1}} \times \frac{\cancel{52}^{\cancel{26}}_{13}}{1}$$
$$= 13$$

13. Evaluate $\frac{1}{3} \div \frac{2}{9} \times 4$

$$= \frac{1}{\cancel{3}_1} \times \frac{\cancel{9}^3}{2} \times 4$$
$$= \frac{3}{\cancel{2}_1} \times \cancel{4}^2$$
$$= 6$$

Chapter-7 Decimals

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Introduction to decimals Expanded form Converting fractions to decimals and vice-versa.	Students will be able to write decimals in expanded form and convert fractions to decimals and vice-versa	Explain to the students the concept of decimal number consisting of whole number and fractional part. 26 — Whole number 25 — fractional part out of 100. Explain the place value chart and expanded form	Fill in the blank. 1) $23.407 = 20 + 3 + \frac{4}{10} + \square + \square$ 2) $\frac{2}{100} + \frac{5}{100} =$ _____

Like and unlike Decimals Conversion of unlike decimals to like decimals. Comparison and ordering of decimals	Students will be able to convert unlike decimals to like decimals and compare and order the decimals.	Worksheet based on ordering and comparisons can be done	Use >, < or = 1) 2.05 ☐ 2.5 2) 0.006 ☐ 0005
Operations on decimals Addition, subtraction multiplication and division of decimals. Word problems on decimal	Students will be able to perform basic operation on decimals and solve word problems based on real life situations	Explain the students the method of performing addition and subtraction of decimals. Explain multiplication and division and shortcut of multiplying and division by 10,100, 1000 and 50 on.	Solve the following $25 + (1.25 - 0.07) - 6 \times 2.0$

Exercise 7.1

1. Write the place value of the underlined digit.

i) $63.\underline{5}4$ – Five tenths/$\frac{5}{10}$

ii) $2\underline{9}.873$ – Nine/9

iii) $0.065\underline{9}$ – Ninety thousandths/$\frac{9}{10000}$

iv) $\underline{9}51.541$ – Nine hundred/900.

v) $5.1\underline{1}340$ – One hundredths/$\frac{1}{100}$

2. Write in expanded form.

i) 63.79 – $20 + 3 + \frac{7}{10} + \frac{9}{100}$

ii) 521.634 – $500 + 20 + 1 + \frac{6}{10} + \frac{3}{100} + \frac{4}{1000}$

iii) 1.05 – $1 + \frac{0}{10} + \frac{5}{100}$

iv) 0.0843 – $0 + \frac{0}{10} + \frac{8}{100} + \frac{4}{1000} + \frac{3}{10000}$

v) 60.54138 – $60 + \frac{5}{10} + \frac{4}{100} + \frac{1}{1000} + \frac{3}{10000} + \frac{8}{100000}$

3. Write in decimal form.

i) $1 + \frac{5}{10}$ – 1.5

ii) $20 + 5 + \frac{3}{10} + \frac{5}{100}$ – 0.297

iii) $\frac{2}{10}+\frac{9}{100}+\frac{7}{1000}$ – 0.297

iv) $800+10+4+\frac{6}{100}$ – 814.06

v) $10+2+\frac{8}{10}+\frac{9}{100}+\frac{4}{1000}$ – 12.894

v) $\frac{6}{100}+\frac{3}{1000}$ – 0.0603

4. Write the following decimal numbers in figures.

i) Three hundred fourteen and twenty five hundredth. **314.25**

ii) Thirty six and six thousandths. **36.006**

iii) Sixty four and twenty five thousandths. **64.025**

iv) Six hundred forty five and sixty six hundredths. **645.66**

v) Eight hundred four and five tenths. **804.5**

5. Write the following decimal number in words.

i) 265.66 – Two hundred sixty five sixty five sixty six hundredths.

ii) 36.075 – Thirty six and seventy five thousandths.

iii) 70.009 – Seventy and nine thousandths.

6. Convert the following fraction to decimals.

i) 0.3

ii) $\frac{7}{4}\times 25 = \frac{175}{100}=1.75$

iii) $\frac{8}{50}\times 2 = \frac{16}{100}=0.16$

iv) $\frac{23}{25}\times 4 = \frac{92}{100}=0.92$

v) $\frac{123}{500}\times 4 = \frac{246}{1000}=0.246$

vi) $\frac{79\times 5}{2000} = \frac{395}{1000}=0.0395$

7. Convert the following decimals to fractions.

i) $0.01=\frac{1}{100}$

ii) $4.8=\frac{\cancel{48}^{24}}{\cancel{10}_{5}}=\frac{24}{5}=4\frac{4}{5}$

iii) $1.25=\frac{\cancel{125}^{25}_{5}}{\cancel{100}_{\cancel{20}^{4}}}=\frac{4}{5}=1\frac{1}{4}$

iv) $35.75=\frac{35\cancel{75}^{715}_{143}}{\cancel{100}_{\cancel{20}_{4}}}=\frac{143}{4}=35\frac{3}{4}$

v) $5.524=\frac{5\cancel{524}^{2762}_{1381}}{\cancel{1000}_{\cancel{500}_{250}}}=5\frac{131}{250}$

vi) $0.004=\frac{\cancel{4}^{\cancel{2}}_{1}}{\cancel{1000}_{\cancel{500}_{250}}}=\frac{1}{250}$

Exercise 7.2

1. Convert the following decimals to like decimals.

i) 23, 6.51, 3.905 = 23.000, 6.510, 3.905

ii) 29.37, 0.101, 400.08 = 29.370, 0.101, 400.08

iii) 15.9, 16, 24.004 = 15.900, 16.000, 24.004

iv) 5.2, 2.59, 3.003 = 5.200, 2.590, 3.003

v) 1.0001, 4,0.6,8.41 = 1.0001, 4.0000, 0.6000, 8.4100

vi) 0.05, 6.3, 9.48, 5.7 = 0.05, 6.30, 9.48, 5.70

2. Insert proper sign (>, <, =).

i) 8.9 [<] 9.8 ii) 17.14 [>] 17.1 iii) 0.1 [>] 0.01

iv) 15.63 [<] 15.65 v) 2 [=] 2.0 vi) 151.9 [>] 151.8

3. Write in ascending order.

i) 35, 3.504, 33.05, 3.55, 30.5 = 3.504, 3.550, 30.50, 33.05, 35.00

ii) 28.08, 20.88, 28.80, 288.8 = 20.88, 28.08, 2880, 288.80

iii) 0.1, 0.01, 0.0001, 1.01 = 0.0001, 0.0100, 0.1000, 1.0100

iv) 1.9, 9.1, 1.09, 0.91 = 0.91, 1.09, 1.90, 9.10

4. Write in descending order.

i) 0.01, 0.1, 0.001, 1 = 1, 0.1, 0.01, 0.001

ii) 7.5, 2.3, 11.09, 0.14 = 11.09, 7.50, 2.30, 0.14

iii) 2.25, 2.29,2.21,2.2 = 2.29, 2.25, 2.21, 2.2

iv) 654.29,650.3,651.28,651.39 = 654.29, 651.39, 651.28, 650.3

Exercise 7.3

1. Add.

i) 2.63, 18.14, 32.5434

$$\begin{array}{r} {\scriptstyle (1)\ (1)\ \ \ \ } \\ {\scriptstyle (1)}2.6300 \\ 18.1400 \\ +\,32.5434 \\ \hline 53.3134 \end{array}$$

∴ **Ans.** 53.3134

ii) 8.17, 6.1, 5,5.145

$$\begin{array}{r} {\scriptstyle (1)\ \ \ \ } \\ 8.170 \\ 6.100 \\ 5.000 \\ +\ 5.145 \\ \hline 24.415 \end{array}$$

∴ **Ans.** 24.415

iii) 3.195, 2.9, 6.73,5

$$\begin{array}{r} {\scriptstyle (1)\ (1)\ \ \ \ } \\ 3.195 \\ 2.900 \\ 6.730 \\ +\ 5.000 \\ \hline 17.825 \end{array}$$

∴ **Ans.** 17.825

iv) 0.01, 6.7, 2.901, 3.8

$$\begin{array}{r} {\scriptstyle (2)\ \ \ \ } \\ 0.010 \\ 6.700 \\ 2.901 \\ +\ 3.800 \\ \hline 13.411 \end{array}$$

∴ **Ans.** 13.411

v) 0.01, 0.005, 0.6, 1.9

$$\begin{array}{r} {\scriptstyle (1)\ \ \ \ } \\ 0.010 \\ 0.005 \\ 0.600 \\ +1.900 \\ \hline 2.515 \end{array}$$

∴ **Ans.** 2.515

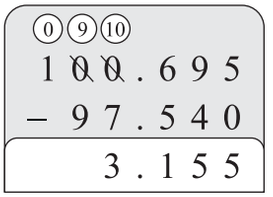
vi) 2.8, 8.2, 2.88, 2.0008

$$\begin{array}{r} {\scriptstyle (1)\ \ \ \ } \\ 2.8000 \\ 8.2000 \\ 2.8800 \\ +2.0008 \\ \hline 15.8808 \end{array}$$

∴ **Ans.** 15.8808

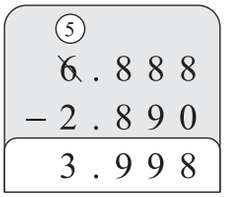
2. Subtract.

i) 97.54 from 100.695



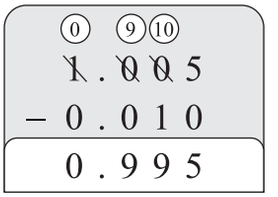
∴ **Ans.** 53.3134

ii) 2.89 from 6.888



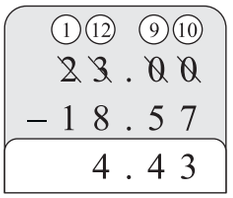
∴ **Ans.** 3.998

iii) 0.01 from 1.005



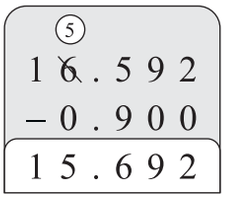
∴ **Ans.** 53.3134

iv) 18.57 from 23



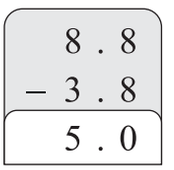
∴ **Ans.** 4.43

v) 0.9 from 16.592



∴ **Ans.** 15.692

vi) 3.8 from 8.8

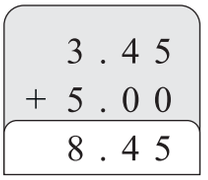


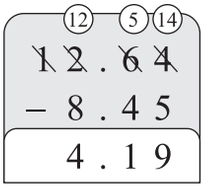
∴ **Ans.** 5.0

3. Simplify.

i) $12.64 - 3.45 - 5$

$= 12.64 - (3.45 + 5)$

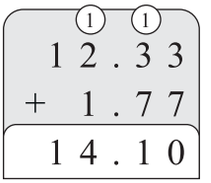


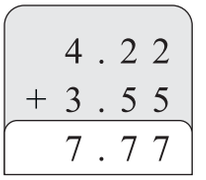


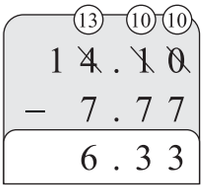
∴ **Ans.** 4.19

ii) $12.33 - 4.22 + 1.77 - 3.55$

$= (12.33 + 1.77) - (4.22 + 3.55)$



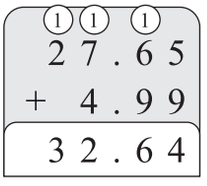


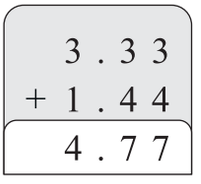


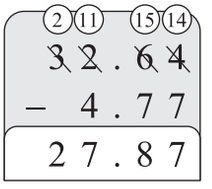
∴ **Ans.** 6.33

iii) $27.65 + 4.99 - 3.33 - 1.44$

$= (27.65 + 65 + 4.99 - 3.33 - 1.44)$







∴ **Ans.** 27.87

4. Subtract 2.97 from the sum of 3.8 and 5.2.

$(3.8 + 5.2) - 2.97$

①
3 . 8
+ 5 . 2
9 . 0

⑧ ⑨ ⑩
~~9~~ . ~~0~~ ~~0~~
−2 . 9 7
6 . 0 3

∴ **Ans.** 6.03

5. Rita has 6.13 m of red ribbon, 1.5 m of blue ribbon and 2.84 m of green ribbon. What is the total length of all the ribbons? How long is the red ribbon than the blue ribbon?

Length of red ribbon = 6.13m

Length of blue ribbon = 1.5m

Length of green ribbon = 2.84m

∴ Total length =

①
6 . 1 3
1 . 5 0
+ 2 . 8 4
1 0 . 4 7

∴ **Ans.** 10.47m

The red ribbon is longer than the blue ribbon by =

⑤ ⑪
6 . ~~1~~ 3
− 1 . 5 0
4 . 6 3

∴ **Ans.** 4.63m

6. I have ₹101.50. My father gave me ₹50.55 and my mother gave me ₹ 20.70. I then gave ₹ 30.50 to my sister. How much money do I have now?

Amt. I had = ₹101.50

Amt. my father gave = ₹50.55

Amt. my mother gave = ₹20.70

∴ Amt. I have =

⑤ ⑪
₹ ~~1~~ ~~0~~ 1 . 5 0
₹ 5 0 . 5 5
+₹ 2 0 . 7 0
₹ 1 7 2 . 7 5

Amt. I gave to my sister = ₹30.50

∴ Amt. I have now =

1 7 2 . 7 5
− 3 0 . 5 0
1 4 2 . 2 5

∴ **Ans.** ₹142.25

7. What must be subtracted from 516.39 to get 254.07?

```
  5 1 6 . 3 9
– 2 5 4 . 0 7
  2 6 2 . 3 2
```

∴ **Ans.** 262.32

Exercise 7.4

1. Arrange in descending order:

i) 2.8×6

```
  2 . 8
  × 6
  1 6 . 8
```

ii) 45.2×7

```
  4 5 . 2
  × 7
3 1 6 . 4
```

iii) 3.9×4.2

```
    3 . 9
  × 4 . 2
    7 8
  1 5 6 ×
  1 6.3 8
```

iv) 4.23×0.3

```
    4 . 2 3
  × 0 .   3
    1 2 6 9
    0 0 0 ×
    1.2 6 9
```

v) 0.218×0.08

```
    0 . 2 1 8
      0 . 0 8
      1 7 4 4
    0 0 0 0 ×
  0 0 0 0 × ×
  0.0 1 7 4 4
```

vi) 82.19×7.5

```
    8 2 . 1 9
      × 7 . 5
    4 1 0 9 5
  5 7 5 3 3 ×
  6 1 6.4 2 5
```

2. Multiply each of the following by 10,100 and 1000.

i) 2.4
by 10 – 24
by 100 – 240
by 1000 – 2400

ii) 0.38
by 10 – 3.8
by 100 – 3.8
by 1000 – 380

iii) 0.007
by 10 – 0.07
by 100 – 0.7
by 1000 – 7

iv) 12.098
by 10 – 120.98
by 100 – 1209.8
by 1000 – 1298

3. Evaluate:

i) $8.64 \div 0.4$

$$\frac{8.64}{0.4} \times 10 = \frac{86.4}{4}$$

$$4\overline{)86.4} = 21.6$$

$-8\downarrow$

6

$-4\downarrow$

24

-24

$\times$

$\therefore \mathbf{Q} = 216$

ii) $0.00078 \div 0.6$

$$\frac{0.00078}{0.6 \times 10} \times 10 = \frac{0.0078}{6}$$

$$6\overline{)0.0078} = 0.0013$$

$-6\downarrow$

18

-18

$\times$

$\therefore \mathbf{Q} = 0.0013$

iii) $16.5 \div 0.15$

$$\frac{16.5}{0.15} \times 10 = \frac{1650}{15}$$

$$15\overline{)1650} = 110$$

$-15\downarrow$

15

-15

$\times$

$\therefore \mathbf{Q} = 110$

iv) $2 \div 5$

$$5\overline{)2.0} = 0.4$$

$-0\downarrow$

20

-20

$\times$

$\therefore \mathbf{Q} = 0.4$

v) $12 \div 0.6$

$$\frac{12}{0.6} \times 10 = \frac{120}{6}$$

$$6\overline{)120} = 20$$

$-12\downarrow$

0

-0

$\times$

$\therefore \mathbf{Q} = 20$

vi) $49.77 \div 0.7$

$$\frac{49.77}{0.7} \times 10 = \frac{497.7}{7}$$

$$7\overline{)497.7} = 71.1$$

$-49\downarrow$

7

$-7\downarrow$

7

-7

$\times$

$\therefore \mathbf{Q} = 71.1$

4. Divide each of the following by 10,100 and 1000.

i) 1.4
- by 10 – 0.14
- by 100 – 0.014
- by 1000 – 0.0014

ii) 0.57
- by 10 – 0.057
- by 100 – 0.0057
- by 1000 – 0.00057

iii) 12.389
- by 10 – 1.2389
- by 100 – 0.12389
- by 1000 – 0.012389

iv) 0.0074
- by 10 – 0.00074
- by 100 – 0.000074
- by 1000 – 0.0000074

5. What must 0.39 be divided by to get 1.3?

$$\frac{0.39}{1.3}\times 10=\frac{\cancel{3.9}^{0.3}}{\cancel{15}_{1}}=0.3$$

6. 0.248 multiplied by what gives 0.1488?

$$\frac{0.1488}{0.248}\times 1000=\frac{\cancel{148.8}^{0.6}}{\cancel{248}}=0.6$$

7. The product of two numbers is 2.56. If one of the numbers is 0.4, find the other number.

$$\frac{2.56}{0.4}\times 10=\frac{\cancel{25.6}^{6.4}}{\cancel{4}_{1}}=6.4$$

8. What must 8 be divided by to get the quotient as 0.32?

$$\frac{8}{0.32}\times 100=\frac{80\cancel{0}}{\cancel{3}2}=25$$

9. Fill in the blanks:

i) $0.785\times$ **100** $=78.5$.

ii) $0.042\times 10=$ **0.42**

iii) $0.986\div$ **10** $=0.0986$

iv) $3.4\div 100=$ **0.034**

10. State true or false.

i) When we divide by 10, the decimal point in a decimal number shifts 2 places to the left. **(False)**

ii) When we multiply by 100, the decimal point shifts to 3 places to the right. **(False)**

iii) $2.3\times 100=.023$ **(False)**

iv) $98\div 10=0.98$ **(False)**

Exercise 7.5

1. Express as rupees.

i) 392 paise
₹3.92

ii) 2485 paise
₹24.85

iii) 500 paise
₹5

iv) 19 paise
₹0.19

v) 645 paise
₹6.45

vi) 23495 paise
₹234.95

2. Express in km.

i) 6 m
0.006km

ii) 2 hm
0.2km

iii) 3 hm 2 m
3hm 2 m
= 302m
0.302km

iv) 5 cm
0.00005km

v) 65 dam
0.65km

vi) 2 m 9 dm
2m 9 dm
= 29dm
0.0029km

3. Convert to kg.

i) 29 gram

$= \frac{29}{1000} = 0.029\text{kg}$

ii) 216 gram

$= \frac{216}{1000} = 0.216\text{kg}$

iii) 894 dg

$= \frac{894}{10000} = 0.0894\text{kg}$

iv) 5 dag

$= \frac{5}{10} = 0.05\text{kg}$

v) 6 hg

$= \frac{6}{10} = 0.6\text{kg}$

vi) 2 kg 5g

$= 2.005\text{kg}$

4. Convert to m.

i) 6m 2 cm
= 6.02 m

ii) 15 cm
= 0.15 m

iii) 2 dm 3 cm
= 23 cm
= 0.23 m

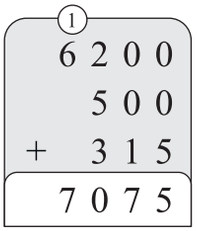
iv) 5 cm
= 0.05 m

v) 3 m 8dm
= 3.8 m

vi) 295 cm
= 2.95 m

5. Charlie has 500 g potato, 6.2 kg tomato and 375 g of onion. What is the total weight of vegetables?

500 g + 6.2 kg + 375 g
= 500 g + 6200 g + 375 g



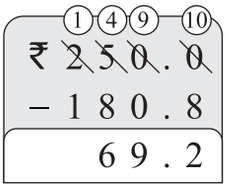
∴ **Ans.** 7075 g vegetables or
7.045 kg vegetables

6. Manju had Rs 250. She gave ₹ 60.5 to her sister and ₹ 120.30 to her brother. How much money does she have now?

Amt. she had = ₹ 250

Amt. she gave =

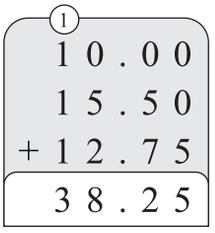
∴ Amt left =



∴ **Ans.** ₹69.2

7. I walked for 10 m on Monday, 15m 50cm on Tuesday and 12m 75cm on Wednesday. What is the total distance covered by me in three days?

10 m + 15 m 50 cm + 12 m 75 cm
= 10.00 m + 15.50 m + 12.75 m



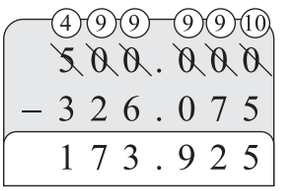
∴ **Ans.** 38.25m

8. Ashish and Manju together contribute ₹ 500 for a party. They spent ₹ 326.75. How much money will they get back?

Amt. given = ₹ 500

Amt. spent = ₹ 326.075

∴ Amt. left = ₹ 500 – ₹ 326.075



∴ **Ans.** ₹173.925

SELF ASSESSMENT-7

1. Write each of the following as decimals.

a) 2 hundredths **0.02**

b) 8 tenths 4 hundredths **0.005**

c) 5 thousandths **0.84**

d) 3 tens 2 tenths 7 hundredths **30.27**

2. Convert the following fractions to decimals.

a) $\frac{3}{10}$ **0.3**

b) $\frac{2}{4}$ **0.5**

c) $\frac{8}{1000}$ **0.008**

d) $6\frac{1}{4}$ $\mathbf{6\frac{1}{4}=\frac{25}{4}=6.25}$

3. I have ₹ 100.75. I spent ₹48.35 on ice-cream. How much money do I have how?

	0	9	10	
₹	1	0	0	. 7 5
−		4	8	. 3 5
		5	2	. 4 0

∴ **Ans.** ₹52.40

4. Sumit has a green ribbon of length 2.5 m, a red ribbon of 0.75 m and a blue ribbon of length 3.18 m. Find the total length of ribbons he has.

		1	1	
		2	. 5 0	m
		0	. 7 5	m
+		3	. 1 8	m
		6	. 4 3	m

∴ **Ans.** 6.43m

5. Find the place value of the underlined digit.

i) 0.6$\underline{7}$8 **$\frac{7}{100}$**

ii) 0.0$\underline{0}$51 **$\frac{0}{100}$**

iii) 10.57$\underline{8}$ **$\frac{8}{1000}$**

iv) 0.0$\underline{0}$10 **$\frac{1}{1000}$**

6. $2\frac{5}{10}$ in decimal form is

b) 2.5

7. 50 cm in metres is

c) 0.5 m

8. 0.5731 + 0.001 = ?

c) 0.5741

9. The place value of 6 in 1.2465 is

d) 6 thousandths

10. 300 mL = _____ L

d) 3 L

11. 2.9 + 0.03 = _____

a) 2.93

12. 0.058 × _____ = 5.8

b) 100

13. _____ ÷ 100 = 0.00973

b) 0.973

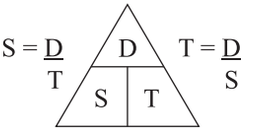
14. 328 m = _____ km

a) 0.328

15. The smallest decimal among 0.03, 0.3, 3.3, 0.0033 is _____

c) 0.0033

Chapter-8 Ratio and Proportion

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Introduction to ratio Expressing ratio in simplest form	Students will be able to understand that ratio is a type if comparison and is comparison of two similar quantities.	Make the children understand how to write a ratio of two quantities. If 'a' is the no of boys and 'b' is the number of girls then ratio of boys : girls = a : b and girl : boys = b : a	In a village there are 100 men, 150 women and 50 children. Find the ratio of i) men : women ii) women : total population iii) women : children
Equivalent ratio	Students will be able to find out equivalent ratios for a given ratio	Explain to the students how to find out equivalent ratios (i.e multiplying and dividing by the same number)	Fill in the boxes 1) 2 : 8 = ☐ : 4 2) 5 : 25 = ☐ : 625
Proportion and Unitary method	Students will be able to identify if two ratios are equal or not. They will be able to solve word problem using unitary method.	Explain to the students that two ratio are equal if their "product of meas = product of extremes' a : b = c:d the b × c = a × d Word problem based on unitary method to be done and finding un known quantities	Are the two ratios in proportion? 2 : 17 and 9 : 13 A man buys 50 sweats for 150 rupees, how many sweats can he buy for 54 rupees?
Percentage : converting percentage to fraction, decimal and vice versa, Finding percentage of a number Application of percentage	Students will be able to calculate percentage and apply it to real life situations.	Explain the concept of percentage 'part of 100' Worksheets on conversion can be done Word problems based on percentage can be done.	1) Is 25% of 520 = 130? 2) Which is greater? 5% of 2500 or 15% of 2000
Speed, Distance and time Conversion of units of speed (m/s →km/hr and vice versa)	The students will be able to calculate speed/ distance/time and will be able to convert units.	Explain the concept of speed, Distance and time and their relation. The following diagram can be used to help them understand better  Word problems based on the above relations to be done.	A man can cover 27 km in 45 minutes. Find his speed is i) km/hr ii) m/sec

Exercise 8.1

1. Write the following ratios in the lowest terms.

i) 144 : 60
24 : 10
12 : 5

ii) 1.4 : 1.8
0.7 : 0 . 9

iii) 0.5 : 1.5
0 . 1 : 0.3

iv) 100 : 150
2 : 3

v) 35 : 15
7 : 3

2. Complete each blank.

i) **21** : 28 = 3 : 4

ii) 15 : 30 = 1 : **2**

iii) 24 : **15** = 8 : 5

iv) 144 : 24 = **6** : 1

v) 18 : 7 = **54** : 21

3. Express each ratio in the simplest from.

i) 45 cm : 2m
= 45cm : 200cm
9 : 40

ii) 5 weeks : 365 days
35 : 365
7 : 73

iii) 300 m : 1 km
= 300 m : 1000 m
3 : 10

iv) 50 min : 3 hr
= 50 min : 180 min
5 : 18

(v) 10 month : 30 month
1 : 3

4. Divide ₹ 1000 between Amit, Sumit and Ranjit in the ratio 3 : 5 : 2.

$$\text{Amit} = \frac{3}{10} \times \cancel{1000}^{100}$$

$$= ₹300$$

$$\text{Sumit} = \frac{5}{10} \times \cancel{1000}^{100}$$

$$= ₹500$$

$$\text{Ranjit} = \frac{2}{\cancel{10}_{1}} \times \cancel{1000}^{100}$$

$$= ₹200$$

5. Divide 66 in the ratio of 4:7.

$$\text{1st part} = \frac{4}{4} \times \cancel{66}^{6}$$

$$= 24$$

$$\text{2nd part} \ \frac{7}{\cancel{11}1} \times \cancel{66}^{6}$$

$$= 42$$

6. The angles of triangle are in the ratio 1: 2 : 3. Find the angles.

1st angle $= \frac{1}{\cancel{6}1} \times \cancel{180}^{30}$

$= 30°$

2nd angle $\frac{2}{\cancel{6}1} \times \cancel{180}^{30}$

$= 60°$

3rd angle $= \frac{3}{\cancel{6}} \times \cancel{180}^{30} = 90°$

7. There as 60 students in a class. 35 of them wear spectacles. Find the ratio of:

i) students who wear spectacles to students who don't wear spectacles.

ii) total students to students who don't wear spectacles.

Total no. of students = 60 stu.

No. of stu. wearing spectacles = 35

No. of stu. not wearing spectacles = $60 - 35$

$= 25$

i) $\cancel{35} : \cancel{25}$ ii) $\cancel{60} : \cancel{25}$

7 : 5 **12 : 5**

8. A man spends ₹ 5000 and saves ₹ 1000. Find the ratio of:

i) savings to expenditure.

ii) savings to total salary.

iii) expenditure to total salary.

i) 1000 : 5000 ii) $\cancel{1000} : \cancel{6000}$ iii) $5\cancel{000} : 6\cancel{000}$

1 : 5 1 : 5 5 : 6

9. A box of fruit has 50 oranges and 40 apples. Find the ratio of:

i) apples to total fruits.

ii) total fruits to oranges.

iii) apples to oranges.

i) $4\cancel{0} : 9\cancel{0}$ ii) $\cancel{90} : \cancel{50}$ iii) $\cancel{40} : \cancel{50}$

4 : 9 9 : 5 4 : 5

10. Divide 250 sweets between A, B and C in the ratio 9 : 10 : 6.

A ; B ; C = 9 : 10 : 6

A' share = $\frac{9}{\cancel{25}} \times \overset{10}{250}$ = 90 sweets

B's share = $\frac{10}{\cancel{25}} \times \overset{10}{\cancel{250}}$

C's share = $\frac{6}{\cancel{25}} \times \overset{10}{\cancel{250}}$ = 60 sweets

11. Divide ₹ 1600 between X, Y and Z in the ratio 3 : 2: 3.

X = $\frac{3}{8} \times \overset{800}{\cancel{1600}}$ = ₹600

Y = $\frac{2}{\cancel{8}_1} \times \overset{200}{\cancel{16}\,\cancel{00}}$ = ₹400

Z = $\frac{3}{\cancel{8}_1} \times \overset{200}{\cancel{1600}}$ = ₹600

∴ X = ₹600, Y = ₹400, Z = ₹600

12. The ratio of sweets distributed between Aman and Sweety is 4 : 7. If Aman has 40 sweets, find how many sweets does Sweety have?

Sweety = $\frac{7}{\cancel{4}_1} \times \overset{10}{\cancel{40}}$ = 70 sweets.

13. If the ratio of boys to girls in a class is 12 : 11 and the number of boys is 96, find the number of girls.

$\frac{11}{\cancel{12}_1} \times \overset{8}{\cancel{96}}$

= 88 girls

Exercise 8.2

1. In each of the following, check whether or not the given ratios form a proportion:

i) 8:16 and 12 : 10

= $\frac{8}{\cancel{16}}$ $\frac{1}{2}$ and $\frac{\cancel{12}}{\cancel{10}}$ $\frac{6}{5}$

∴ Not in proportion

ii) 16:28 and 36 : 63

= $\frac{16}{\cancel{28}}$ $\frac{4}{7}$ and $\frac{\overset{18}{\cancel{36}}}{\cancel{63}_{27}}$ $\frac{4}{7}$

∴ In proportion

iii) 28 : 7 and 8 : 2

$= \frac{28}{7}\ 4$ and $\frac{8}{2}\ 4$

$\therefore$ In proportion

iv) 25 : 30 and 55 : 66

Product of extremes = 25×66

Product of means = 30×55

= 1650

$\therefore$ In proportion

v) 91 : 104 and 14 : 16

Product of extremes = 1456

Product of means = 1456

$\therefore$ In proportion

2. Find the value of x in each of the following proportions :

i) $x : 4 = 6 : 12$

Product of extremes = $12 \times x$

Product of means = $6 + 4$

= 24

$\therefore x = \frac{24}{12}\ 2$

ii) $21 : x = 7 : 9$

Product of extremes = 21×9

= 189

Product of means = $7 + x$

$\therefore x = \frac{189}{7_1}\ 27$

iii) $4 : 6 = x : 78$

Product of extremes = 312

Product of means = $6 + x$

$\therefore x = \frac{312}{6_1}\ 52$

iv) $12 : 5 = x : 25$

Product of extremes = 12×25

= 300

Product of means = $5 + x$

$\therefore x = \frac{300}{5}\ 60$

v) $5 : 15 = 12 : x$

Product of extremes = $5 \times x$

Product of means = $15 + 12$

= 180

$\therefore x = \frac{180}{5}\ 36$

3. Find the value of x so that the given four numbers are in proportion :

i) x, 6, 10, 12

$x = \frac{6\times10}{12}$

$= \frac{\cancel{60}}{\cancel{12}}5$

ii) 4, x, 15 and 90

$x = \frac{4\times90}{15}$

$= \frac{360}{15}24$

iii) 2, x, 10 and 65

$x = \frac{2\times65}{10}$

$= \frac{\cancel{130}}{\cancel{10}}13$

iv) 4, x, 6 and 18

$x = \frac{4\times18}{6}$

$= \frac{\cancel{72}}{\cancel{6}}12$

v) 9, 12, x and 4

$x = \frac{9\times4}{12}$

$= \frac{3\cancel{6}}{\cancel{12}}3$

4. The first, second and the fourth terms of a proportion are 26, 18 and 144 respectively. Find its third term.

Product of extremes = 26 × 144

= 3744

Product of means = 18 × x

∴ The third term = $\frac{\cancel{3744}}{\cancel{18}}208$

5. Find the second term of the proportion whose first, third and fourth terms are 18, 16 and 24 respectively.

Product of extremes = 18 × 24

= 432

Product of means = x × 16

∴ The second term = $\frac{4\cancel{32}}{\cancel{16}}27$

6. Find the fourth term of the proportion whose first, second and third terms are 15, 36 and 45 respectively.

Product of extremes = 15 × x

Product of means = 36 × 45

= 1620

∴ The fourth term = $\frac{1\cancel{620}}{\cancel{15}}108$

7. The ratio of the length and the width of a school ground is 5:4. Find the length, if the width is 20 metres.

Length = $\frac{5}{4_1}\times\overset{5}{20}$ m

= 25 metres

8. The ratio of the sale of cakes on a Sunday and that of the whole week at a confectionery shop was 5 : 9. If the total value of the sale of cakes in the same week was ₹360, find the value of the sale of cakes that Sunday.

$\frac{5}{\cancel{9}_1}\times\overset{40}{\cancel{₹360}}$

= ₹200

9. The ratio of my age to my daughter's age is 1:6. If I am 36 years, what is the age of my daughter?

$$\frac{1}{\cancel{6}_{1}} \times \overset{6}{\cancel{36}}$$

$= 6$ years

10. The number of red marbles to blue marbles in a box is 2:9. If there are 64 red marbles, find the number of blue marbles.

$$\frac{9}{\cancel{2}_{1}} \times \overset{32}{\cancel{64}}$$

$= 288$ blue marbels

Exercise 8.3

1. The cost of 17 exercise books is ₹ 255. Find the cost of 36 such exercise books.

Cost of 17 exercise books $= ₹255$

Cost of 1 exercise book $= \frac{255}{17}$

$\therefore$ Cost of 36 exercise books $= \frac{255^{15}}{17} \times 36$

$= 540$

$\therefore$ **Ans.** ₹540

2. A car travels 800 km in 20 hours. How far will it travel in 11 hours?

Distance travelled by a car in 20 hours $=$ 800km

Distance travelled by a car in 1 hour $= \frac{800}{20}$

$\therefore$ Distance travelled in 11 hours $= \frac{\overset{40}{\cancel{800}}}{\cancel{20}_{1}} \times 11$

$= 440$

$\therefore$ **Ans.** 440 km

3. If 40 men can produce 1600 toys. How many toys will be produced by 75 men?

No. of toys produced by 40 men $=$ 1600 toys

No. of toys produced by 1 man $= \frac{\cancel{1600}}{\cancel{40}}$ 40 toys

$\therefore$ No. of toys produced by 75 men $= 75 \times 40$

$= 3000$

$\therefore$ **Ans.** 3000 toys

4. If 18 m ribbon can be cut into 6 equal parts, find the number of parts that can be obtained from 90 m.

No. of parts that can be cut from 18m ribbon = 6 parts.

No. of parts that can be cut from 1m ribbon = $\frac{\cancel{18}}{\cancel{6}}$ 3 parts.

∴ No. of parts that can be cut from 90 m ribbon = 90 × 3

= 270 parts.

∴ **Ans.** 270

5. 16 jugs can hold 112 L of milk. How muck milk will 18 jugs hold?

Litres of milk 16 jugs can hold = 112L

Litres of milk 1 jug can hold = $\frac{112}{16}$

∴ Litres of milk 18 jugs can hold = $\frac{\overset{14}{\cancel{112}}}{\cancel{16}_{8_1}} \times \cancel{18}^{9}$

= 126

6. If 28 pizzas costs ₹1120, find the cost of 15 pizzas.

Cost of 28 pizzas = ₹1120

Cost of 1 pizza = $\frac{1120}{28}$

∴ Cost of 15 pizzas = $\frac{\overset{5\cancel{60}^{20^{40}}}{11\cancel{20}}}{\cancel{28}_{14_{1}}}$

= 600

∴ **Ans.** ₹600

7. If 10 apples weigh 3 kg, what is the weight of 40 apples?

Weight of 10 apples = 3kg

Weight of 1 apple = $\frac{3}{10}$

∴ Weight of 40 apples = $\frac{3}{\cancel{10}_{1}} \times \overset{4}{\cancel{40}}$

= 12

∴ **Ans.** 12kg

8. The cost of 13 tables is ₹39000. Find the cost of 7 tables.

Cost of 13 tables = ₹39000.

Cost of 1 table = $\frac{\cancel{39000}}{\cancel{13}_{1}}$ 3000

∴ Cost of 7 tables = 3000 × 7

= 21000

∴ **Ans.** ₹2100

9. If 5 chart papers can be cut into 60 pieces, how many pieces can 19 chart papers be cut into?

No. of pieces 5 chart papers can be cut into = 60 pieces.

No. of pieces 1 chart paper can be cut into = $\frac{\cancel{60}}{\cancel{5}}$ 12

∴ No. of pieces 19 chart papers can be cut into = 12 × 19

= 228

∴ **Ans.** ₹228

Exercise 8.4

1. Convert to m/s.

i) 180 km/hr

= $180 \times \frac{5}{\cancel{18}_{1}}$

= 50 m/sec

ii) 900 km/hr

= $9\cancel{00} \times \frac{5}{\cancel{18}_{1}}$

= 250 m/sec

iii) 70 km/hr

= $7\cancel{0} \times \frac{5}{\cancel{18}_{\cancel{9}_{1}}}$ = 19.44 m/sec.

iv) 140 km/hr

= $\cancel{70}^{7.777}\ 140 \times \frac{5}{\cancel{18}_{9}}$

= 38.885 m/sec

vi) 108 km/hr

= $\cancel{108}^{6} \times \frac{5}{\cancel{18}}$

= 30 m/s

2. Convert to km/hr.

i) 70 m/sec

= $\cancel{72} \times \frac{18}{\cancel{5}_{1}}$

= km/hr

ii) 144 m/sec

= $\cancel{144}^{28.8} \times \frac{18}{\cancel{5}}$

= 518.4 km/hr

iii) 60 km/min

= $\cancel{60}^{1} \times \frac{1}{\cancel{60}_{1}}$

= 1 km/hr

iv) 90 m/sec

= $\cancel{90}^{18} \times \frac{18}{5_{1}}$

= 324 km/hr

v) 108 m/sec

= $\cancel{108}^{21.6}$ = $\frac{18}{\cancel{5}_{1}}$

= 388.8 km/hr

vi) 18 m/sec

= $\cancel{18}^{3.6} \times \frac{18}{\cancel{5}_{1}}$

= 64.8 km/hr

3. Which speed is greater 54 km/hr or 25 m/s?

54 km/hr or 25 m/s

$= 54$ km/hr or $\cancel{25}^{5} \times \frac{18}{81}$

$= 54$km/hr or 90km/hr

$\therefore$ **Ans.** 90km/hr or 25 m/sec

4. A man cycled 85 km in 5 hours. What was his speed?

$$\text{Speed} = \frac{\cancel{85}^{17}\ \text{km}}{\cancel{5}\ \text{hrs}}$$

$$= 17\ \text{km/hr}$$

5. A cycle was driven 375 km in 2 hours. What was the speed for the trip?

$$\text{Speed} = \frac{\cancel{375}^{187.5}\ \text{km}}{\cancel{2}_{1}\ \text{hrs}}$$

$$= 187.5\ \text{km/hr}$$

6. A train covers 25 km in 30 minutes. Find his speed in m/sec and km/hr.

$D = 25\text{km} = 25\ \text{km} \times 1000 = 25000\ \text{m}$

$T = 30\ \text{min} = 30 \times 60 = 1800\ \text{sec}$

$$\text{Speed} = \frac{D}{T} = \frac{25000}{1800} = \frac{125}{9}\ \text{m/s}$$

$$\text{Speed is km/hr} = \frac{\cancel{125}^{25}}{\cancel{9}} \times \frac{\cancel{18}^{2}}{\cancel{5}}$$

$$= 50\ \text{km/hr}$$

7. A bus travels at 70 km/hr for 4 hours. How far has it travelled?

$$\text{Distance} = 70 \times 4$$

$$= 280\ \text{km}$$

8. Aakash drove at a constant speed for 3 hours. Find his speed if the distance covered was 120 km.

$$\text{Speed} = \frac{120}{\cancel{3}_{1}}\ 40\ \text{km/hr}$$

9. Sumit drove at a speed of 75 km per hour for 5 hours. Find the distance he travelled.

$$\text{Distance} = 75 \times 5$$

$$= 375\ \text{km}$$

10. A car travels at 50 m/sec for 60 min. How many km does it travel?

$60\ \text{min} = 3600\ \text{sec}$

$D = S \times T$

$D = 50 \times 3600$

$= 180000\ \text{m}$

$$= \frac{180000}{1000}$$

$= 180\ \text{km}$

11. If a car is driven at the average speed of 2 km/min for 3 hours and 20 minutes, how far will it go?

3hrs 20mins

= 200 mins

2 × 200 mins

= 400 km

12. A train travels 120 km in 30 minutes. Find the speed of the train.

D = 120 km

$T = 30 \text{ min} = \frac{30}{60} = \frac{1}{2} \text{ hr}$

$S = \frac{D}{T} = \frac{120 \times 2}{1} = 240 \text{ km/hr}$

Exercise 8.5

1. Convert the fractions into percentage.

(i) $\frac{3}{4} \times 25 = \frac{75}{100} = 75\%$

(ii) $1\frac{2}{5}$

$= \frac{8}{5} \times 20 = \frac{160}{100} = 160\%$

(iii) $\frac{23}{10} \times 10 = \frac{230}{100} = 230\%$

(iv) $\frac{14}{20} \times 5 = \frac{70}{100} = 70\%$

(v) $\frac{3}{7} \times 14.285 = \frac{42.855}{100} = 42.855\%$

(vi) $\frac{1}{3} \times 33.333 = \frac{33.333}{100} = 33.333\%$

2. Express the percentage as a fraction.

(i) 250%

$\frac{\cancel{25}\,\cancel{0}}{\cancel{10}\,\cancel{0}} = \frac{5}{2}$

(ii) 38%

$\frac{\cancel{38}^{19}}{\cancel{100}_{50}} = \frac{19}{50}$

(iii) 65%

$\frac{\cancel{65}^{13}}{\cancel{100}_{20}} = \frac{13}{20}$

(iv) 25%

$\frac{\cancel{25}}{\cancel{100}} = \frac{1}{4}$

(v) 30%

$\frac{\cancel{30}}{\cancel{100}} = \frac{3}{10}$

(vi) 3%

$\frac{3}{100}$

3. Convert the decimal into percentage.

(i) 3.20 = **320%**
(ii) 2.59 = **259%**
(iii) 2.30 = **230%**
(iv) 8.45 = **845%**
(v) 0.09 = **9%**
(vi) 0.432 = **432%**

4. Express the following percentage as decimal.

(i) 82% = **0.82**
(ii) 18% = **0.18**
(iii) 19% = **0.19**
(iv) 81% = **0.81**
(v) 140% = **1.40**
(vi) 2% = **0.02**

5. Find the value of :

(i) 20% of ₹100

$\frac{20}{\cancel{100}_{1}} \times \overset{1}{\cancel{₹100}}$

$= ₹20$

(ii) 16% of 250 gm

$\frac{25}{\cancel{100}_{1}} \times \overset{2}{\cancel{200}}$

$= 40 \text{ gm}$

(iii) 18% of 450

$\frac{\cancel{18}^{9}}{\cancel{100}_{21}} \times \overset{9}{\cancel{45}\cancel{0}}$

$= 81$

(vi) 25% of 200

$\frac{25}{\cancel{100}_{1}} \times \overset{2}{\cancel{200}}$

$= 50$

(v) 15% of 300

$\frac{15}{\cancel{100}_{1}} \times \overset{3}{\cancel{300}}$

$= 45$

(vi) 75% of 600

$\frac{75}{\cancel{100}} \times \overset{6}{\cancel{600}}$

$= 450$

6. 88% of the children in a class like mango and the rest likes bananas. What percent of children like bananas?

$100 - 88 = 12$

$\therefore$ **Ans.** 12% of the class line bananas

7. Out of 50 students in a class, 22 students scored grade 'A' in art and craft. What percent of students scored grade 'A'?

$\frac{22}{50} \times 2 = \frac{44}{100}$

$\therefore$ Ans. 44% of the class scored 9 grade A.

8. In a fruit basket, 30% of fruits are apples, 25% are oranges and rest are bananas. What percent of fruits are bananas?

$100 - (30 + 25)$

$= 100 - 55$

$= 45$

$\therefore$ **Ans.** 45% of the fruits are bananas

9. Which is more : 30% of 150 or 13% of 200?

$\frac{\overset{15}{\cancel{30}}}{\cancel{100}_{21}} \times \overset{3}{\cancel{15}\cancel{0}} = 45$

$\frac{13}{100_{1}} \times \overset{2}{\cancel{200}} = 26$

$\therefore$ 30% of 150 is more

10. Which is greater: 30% or 0.003?

30% or 0.003

$= 30\%$ or 0.3%

$\therefore$ 30% is more

11. In a test, a student answered 40% of the given question. If total number of questions was 150, find:

(i) number of questions answered.

(ii) number of question not answered.

(i) $\frac{\overset{20}{\cancel{40}}}{\cancel{10}\cancel{0}_{2}} \times \overset{3}{13\cancel{0}} = 60$

$\therefore$ **Ans.** 60 questions

(ii) $150 - 60 = 90$

$\therefore$ **Ans.** 90 questions

SELF ASSESSMENT-8

1. Find the ratio :

i) 2yrs : 18 months

= ~~24~~ months : ~~18~~ months

~~12~~ : 9

4 : 3

ii) 5 min : 30 sec

= 300 sec : 30 sec

10 : 1

iii) 105 : 135

21 : 27

3 : 9

1 : 3

iv) 2.4 : 7.2

12 : 3.6

0.4 : 1.2

0.1 : 03

2. Find the unknown:

i) 1 : 8 = 6 : **48**

ii) 27 : 36 = **54** : 72

iii) 3.9 : 6.5 = **3** : 5

iv) 50 : 200 = **200** : 800

3. Give two equivalent ratio for:

i) 1 : 9 = 2 ; 18, 3 : 27

ii) 3 : 5 = 6 : 10, 9 : 15

iii) 2.4 : 1.3 = 4.8 : 26, 7.2 : 3.9

iv) 35 : 105 = 7 : 21, 1 : 3

4. Are the following ratio in proportion?

i) 2:4 and 1:8

Product of extremes = 8 × 2 = 16

Product of means = 4 × 1 = 4

∴ Not in proportion

ii) 26 : 13 and 2: 1

Product of extremes = 26 × 1 = 26

Product of means = 13 × 2 = 26

∴ In proportion

iii) 5:4 and 8:7

Product of extremes = 5 × 7 = 35

Product of means = 4 × 8 = 32

∴ Not in proportion

iv) 2.1: 2 and 3: 4.2

Product of extremes = 2.1 × 4.2 = 8.82

Product of means = 3 × 2 = 6

∴ Not in proportion

5. If 20 books cost ₹ 3000, find the cost of 50 books.

$$\text{Cost of 50 books} = \frac{\overset{1500}{\cancel{3000}}}{\underset{1}{\cancel{20}}} \times 5\cancel{0}$$

$$= 7500$$

∴ **Ans.** ₹7500

6. 2 : 4 : : ☐ : 36 the unknown.

a) 72

7. One ratio equivalent to 3 : 7 is

c) 21 : 49

8. The ratio 81 : 45 in the simplest form.

a) 9 : 5

9. The cost of 25 kg apple is ` 1000, then the cost of 10 kg apple is

c) ₹400

10. If ₹ 700 is divided between A and B in the ratio 3 : 4, then B's share is

a) ₹ 400

11. $\frac{\mathbf{2}}{\mathbf{100}}$ in percentage form is

(b) 2%

12. 3% of 1500 is

c) 45

Chapter-9 Algebra

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Introduction : Variables And Constants	To understand the concepts of variables and constants through various examples	Explain the terms variables and constants through different examples that they have already learned. Variables:- those whose value is changing (varying) Constants : those whose value if fixed Egs:- The perimeter of a rectangle is 2 ($l + b$) where l and b are variables which are varying from problem to problem and 2 is a constant. Variables are usually denoted by small letters of English alphabet and constants are the numbers.	Identify the constants and variables 1) $3x$ 2) $\frac{4}{7}xy$ 3) $6.5x^2y$

Match Stick patterns and the rule to find the number of matchsticks	To write the number of match sticks required to make the given patterns in terms of constants and variables	 (a) (b) (c) No. of match sticks required to make one F is = 4 = 1 × 4 No. of match sticks required to make two Fs is = 8 = 2 × 4 No. of match sticks required to make three Fs is = 12 = 3 × 4 No. of sticks required to make in Fs is = n × 4 = 4n Egs :- A box contains 50 apples. So number of apples in b boxes is 50 × b = 50b.	How many matchsticks will be required to make 7 Fs?
Use of Variables in Common Rules	To understand the different formulae like perimeter of square and rectangle area of square and rectangle, rule in arithmetic etc.	Perimeter of a square of side a = 4a Perimeter of rectangle = 2 (l + b) Commutativity property: a + b = b + a a × b = b × a Associativity property:- a + (b + c) = (a + b) + c a × (b × c) = (a × b) × c Distributive property :- a (b + c) = ab + ac	Write algebraic expression 1) 7 added to the product of *x* and *y* 2) 8 subtracted from m
		'5 added to y' = 5 + y, x divided by $3 = \frac{x}{3}$	
Using Expressions Practically	Students will be able to express the practical situations in terms of variables and constants.	Demonstrate daily life problems where variables can be used like age related questions. If Saritha's present age is x years after 10 years her age will be x + 10. Do more problems from the exercise.	Write algebraic expression If Aman in 4 years older than Sunil, what is Amans age 8 years hence?

Equation	Students will be able to write equation and its solution.	An expression containing variables and constants in which equal sign exist is called an equation. $x + 5 = 10$ is an equation The left side of '=' sign is called LHS and right side is called RHS When we replace the variable by some number if LHS = RHS the that value is called the solution of the equation. In the above equation x=5 is a solution. Show the verification in different problems and make the children understand the concept of equation and its solution.	Solve : A number when increased by 15 gives 75. Find the number.

Exercise 9.1

1. **If there are 5 pencils is one box, find the number of pencils in y boxes.**
   5 y pencils
2. **If 1 apple costs ₹ 12, find the cost of x apples.**
   12x
3. **If there are 10 students in one class, find the number of students in t classes.**
   10t students
4. **If Sam is 5 yrs older than Rumi, what is Sam's age?**
   x + 5 years (lets assume Rumi's age as x)
5. **If an orange costs ₹ 8 more than an egg, what is the cost of an egg?**
   ₹x – 8 (let's assume – orange as x)
6. **Smriti has ` n. She gave ₹ 100 to Raman. How much does she have now?**
   ₹n – ₹100
7. **Find the rule which gives the number of matchsticks required to make the following matchstick patterns. Use variable to write the rule.**
   (i) A pattern of V as
   No. of matchsticks required to make 1 'V' = 2
   If V is represented by x
   Then, 1 'V' = 2x matchsticks (2 × x)

(ii) A pattern of F as

No. of matchsticks required to make 1 'F' = 3

If 'F' = 3y matchsticks (3 × y)

(iii) A pattern of Z as

No. of matchsticks required to make 1 'Z' = 3

If 'Z' is represented by n

Then, 1 'Z' = 3n matchsticks (3 × n)

(iv) A pattern of T as

No. of matchsticks required to make 1 'T' = 2

If '2' is represented by a

Then, 1 'T' = 2 a matchsticks (2× a)

8. If there are 20 mangoes in a box, how will you write the total number of mangoes in n boxes?

20 n mangoes

9. There are 8 plants planted in a row. How many plants are there if there are x number of rows.

8*x* plants

10. Sam and Shree are sisters. Sam is 4 years younger than Shree. What is Sam's age in terms of Shree's age? Take Shree's age as p years.

P - 4 years

11. Ritika scored 15 more marks than her friend Priyanshi. What is the score of Ritika? Take Priyanshi's score as m.

(m + 15) marks

12. The figure given alongside a matchstick pattern of triangle. Find the general rule that gives the number of matchsticks in terms of the number of triangles.

Number of matchsticks required to make 1 triangle × no. of triangles. i.e 3*x*.

Exercise 9.2

1. Identify the terms involved in the following expressions.

i) $a + 2 = 9, 2$ are the terms

ii) $b + c - 3 = b, c, -3$ are the terms

iii) $4p + 1 = 4p, 1$ are the terms

iv) $\frac{6}{q} - 5 \quad \frac{6}{q}, -5$ are the terms

2. Identify the equations and the expressions.

i) $9 + 2 = 5$ **Equation**

ii) $a + b$ **Expression**

iii) $\frac{x}{3}y$ **Expression**

iv) $2x = 9$ **Equation**

3. Identify the like terms.

i) x, 3x, y, –7y, 5x

x, 3x and 5x are like terms.

y and –7y are like terms.

ii) a, bc, $\frac{-a}{3}$, 7bc, $\frac{bc}{9}$, 5a

a, $\frac{-a}{3}$, 5a are like terms

bc, 7bc, $\frac{bc}{9}$ are like terms

iii) pq, qp, p, q

pq and qp are like terms

iv) xy, x, 3x 2y, $\frac{y}{a}$

x, 3x are like terms

2y, $\frac{y}{a}$ are like terms

4. Write the coefficient of p in :

i) 4p = **4** ii) –3pq = **–3q** iii) 5 pqr = **5qr** iv) p = **1**

5. Find the degree of the following polynomials.

i) 3a2 + b = **2**

ii) x+ y +z = **1**

iii) xyz + a2 = **3 (∵ xyz total degree is 3)**

iv) pq + qr +s = **2 (∵ xyz total degree is 3)**

6. Write the expression for the following.

i) The sum of a and b = **a + b**

ii) The product of 3 and x = **3*x***

iii) The difference of b and 4 = **b – 4**

iv) 4 more than p = **p + 4**

v) n decreased by 10 = **n – 10**

vi) 5 times z = **5z**

vii) 3 times a increased by 2 = **3a + 2**

viii) x divided by 7 = $\frac{\mathbf{x}}{\mathbf{7}}$

ix) 7 times b decreased by y = **7b –y**

x) 2 less than 6 times x = 6*x* – 2

7. Write the statements for the following:

i) x - 4 = 4 taken away from *x*

ii) 2a + b = b added to 2 time a

iii) $\frac{P}{3} - 1$ = 1 less than p divided by 3

iv) 3m + 6 = Sum of 3 times m and 6.

v) p + q = 3 subtracted from p multiplied by q.

vi) p q – 3 = 5 added to *x* divided by 7.

vii) $\frac{P}{3} - 1$ = 3 subtracted from p multiplied by q.

viii) $\frac{P}{3} - 1$ = Difference between 2 times p and q divided by 3.

ix) x – 3y = 3 times y subtracted from x.

x) (p + q) 4 = Sum of p and q multiplied by 4.

8. A car travels p km per hour. It is going from Delhi to Chandigarh. After the car travelled 3 hours, Chandigarh is still 10 km away. What is the distance from Delhi to Chandigarh?

$(3p + 10)$ km

Exercise 9.3

1. Complete the following table.

	Equation	Value of variable	Solution (Y/N)
i)	$x + 3 = 8$	$x = 5$	**Yes**
ii)	$10 = 50y$	$y = 500$	**No**
iii)	$p - 14 = 4$	$p = 10$	**No**
iv)	$20 + a = 22$	$a = 2$	**Yes**
v)	$5y = 30$	$y = 4$	**No**
vi)	$29 - x = 30$	$x = 1$	**No**

2. Find a solution for the following equation using trial and error method.

i) $x + 6 = 8$

Try out putting different values of x and check. Here the solution is 2

Putting $x = 2$

$2 + 6 = 8$

$8 = 8$

Hence 2 is the solution

ii) $x - 2 = 10$

putting $x = 12$

$12 - 2 = 10$

$10 = 10$

Hence, 12 is the solution.

iii) $4x = 6$

Putting $x = \frac{3}{2}$

$4 \times \frac{3}{2} = 6$

Hence $\frac{3}{2}$ is the solution.

iv) $\frac{x}{2} = 5$

$x = 10$ is the solution.

3. Find a solution for the following equation using balancing method.

i) $n + 3 = 5$

or, $n + 3 - 3 = 5 - 3$

or, $n = 2$

ii) $3z = 27$

or, $\frac{3z}{3} = \frac{27}{3}$

or, $z = 9$

iii) $p + 6 = 14$

or, $P + 6 - 6 = 14 - 6$

or, $P = 8$

iv) $\frac{a}{4} = 5$

or, $\frac{a}{4} \times 4 = 5 \times 4$

or, $a = 20$

4. Find the solution for the following equation using transposition method.

i) $8 - z = 4$

or, $8 - 4 = z$

or, $z = 4$

ii) $\frac{P}{10} = 3$

or, $p = 3 \times 10$

$p = 30$

iii) $2p + 3 = 11$

or, $2p = 11 - 3$

or, $2p = 8$

or, $p = \frac{8}{2}$

$P = 4$

iv) $\frac{m}{3} + 5 = 9$

or, $\frac{m}{3} = 9 - 5$

or, $\frac{m}{3} = 4$

or $m = 12$

v) $0.2y = 3$

or, $y = \frac{3}{0.2} = 15$

vi) $3(x + 7) = 18$

or, $x + 7 = \frac{18}{3}$

or, $x + 7 = 6$

or, $x = 6 - 7$

or, $x = -1$

vii) $3(2x + 1) = 3(3x - 5)$

$2x + 1 = \frac{\cancel{3}(3x - 5)}{\cancel{3}}$

or, $2x + 1 = 3x - 5$

or $1 + 5 = 3x - 2x$

or, $6 = x$

viii) $4(2x + 1) = 5(x + 1)$

or, $8x + 4 = 5x + 5$

or, $8x - 5x = 5 - 4$

or $3x = 1 \Rightarrow x = \frac{1}{3}$

Exercise 9.4

1. Write the expressions for the following.

i) The cost of 1 egg is ₹5, then the cost of 10 eggs is?
$10 \times 5 =$ ₹50

ii) If I cover 20 km in 5 hrs, how much distance do I cover in y hours?
$(20 \div 5) \times y = 4y$ km

iii) Basant is m yrs younger to Neena. If Neena is 36 yrs, what is Basant's age?
$36 - m$ years

iv) Gargi has x marbles. Hemant has y marbles. How many marbles do they have together?
$x + y$ marbles

v) If p ticket cost ₹15, what is the cost of 20 tickets?
$\left(\frac{15}{9}\right) \times 20$

vi) If I am x yrs old and my mother is four times my age, what is my mother's age?

4x years

2. Write the equation for the following.

i) 2 times my age is equal to 3 times my age decreased by 12.

$2x = 3x - 2$

ii) The cost of 6 apples is equal to the cost of 7 apples decreased by 5.

$6x = 7x - 5$

iii) Dorothy scored 10 more than Sonu, and the sum of their marks is 44.

$(x + 10) + x = 44$ marks

$2x + 10 = 44$

iv) Aanchal weighs 3 times of Varnica, and the sum of their weights is 50 kg.

$3x + x = 50$ kg

v) If there are x children in a room, 20 more get in, then the new number of children is 5 times the orginal.

$x + 20 = 5x$

vi) The C.P. of 1 orange decreased by 12 is equal to ₹50.

$x - 12 =$ ₹50

3. A number decreased by 4 is 9. What is the number?

$x - 4 = 9$

$\Rightarrow x = 9 + 4$

$\Rightarrow x = 13$

4. I get Y marks in a class test and my friend got 2 less than me. If my friend got 12, find my marks.

$y - 2 = 12$

$\Rightarrow y = 12 + 12$

$\Rightarrow y = 14$

$\therefore$ My marks is 14

5. 2 times a number is 18, find the number.

$2x = 18$

$\Rightarrow x = \frac{\cancel{18}}{2} 9$

$\therefore$ The number is 9

6. A number divided by 7 is equal to3, find the number.

$\frac{x}{7} = 3$

$\Rightarrow x = 3 \times 7$

$\Rightarrow \times = 21$ (Ans.)

SELF ASSESSMENT-8

1. Find the solution for:

(i) $x + 19 = 0$

$x = 0 - 19$

$x = -19$ **(Ans.)**

(ii) $y - 2/3 = 0$

$\Rightarrow \frac{3y - 2}{3} = 0$

$\Rightarrow 3y - 2 = 0 \times 3$

$\Rightarrow 3y - 2 = 0$

$\Rightarrow 3y = 0 + 2$

$\Rightarrow 3y = 2$

$\Rightarrow y = \frac{2}{3}$

(iii) $5x = -20$

$\Rightarrow x = \frac{-20}{5}$

$\Rightarrow x = -4$

(iv) $\frac{x}{27} = -3$

$\Rightarrow x = -3 \times 27$

$\Rightarrow x = -81$ **(Ans.)**

2. Write the expression for:

(i) 5 more than a number = $\boldsymbol{x + 5}$

(ii) 2 less than a number = $\boldsymbol{x - 2}$

(iii) Four fifth of a number = $\frac{\mathbf{4}}{\mathbf{5}} x$

(iv) One eight of a number decreased by 3 = $\frac{\mathbf{1}}{\mathbf{8}} x - \mathbf{3}$

3. A solution for $x - 9 = 10$ is

(b) 19

4. The expression for $x + 3$ is

a) a number increased by 3

5. Fifteen taken away from x is

a) $x - 15$

6. Which of these is equal to $5x + (-7x) + 4x$?

a) $2x$

7. $x = 5$ is a solution for

a) $x - 5 = 0$

8. The product of 7 and x increased by 2.

b) $7x + 2$

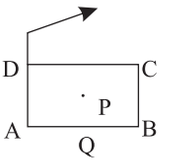
9. The number of terms in a binomial is

b) 2

10. The degree of the polynomial $pqr + 1$ is

c) 3

Chapter-10 Basic geometrical Concepts

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Points, Lines, Line segments, Rays, Intersecting Lines and Parallel Lines.	Students will be clear with geometry and their representations.	Demonstrate figures on the black board or on the smart board and make the children understand the representations of them. points : A, B, C points : P, Q, ↔PQ line segment: A, B, $\overline{PQ}$ Intersecting lines: A line segment: O, P ray: parallel lines: A, B	Consider the figure below  Name the 1) rays 2) line segments ii) interior point
Curves and Polygons	Understand the different types of curves such as simple curve, open curve, closed curve etc. What type of curve is called a polygon. The meaning of interior and exterior regions.	not simple: simple: closed: not simple but closed: Polygon Simple closed & made up of line segments only Interior exterior	Consider the figure below

Exercise 10.1

1. Fill in the blanks.

i) Two lines have **one** intersecting point.

ii) A point has only **position**.

iii) A line segment has a **2** end point.

iv) Parallel lines never **meet**.

v) A line segment is a part of a **line**.

2. State true or false.

i) A ray extends in two directions. **False**

ii) A line segment has two end points. **True**

iii) Two parallel lines are also perpendicular lines. **False**

iv) The railway tracks are example of parallel lines. **True**

v) A point has length, breadth and thickness. **False**

3. Answer the following.

i) How many end points are there in a line?
No end points

ii) Can two lines intersect at more than one point?
No

iii) How many end points does a line segment have?
Two

iv) The letter 'X' is an example of what kind of lines?
Intersecting Lines

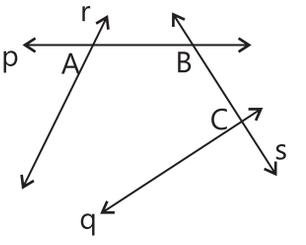
v) How many lines can you draw between two points?
One

vi) The opposite walls of your room are example of what kind of lines?
Parellel lines

vii) Give an example of a ray and perpendicular lines.
Sun rays

viii) Give two examples of perpendicular lines.
alphabet L, corner of your book

4. From the adjoining figure :

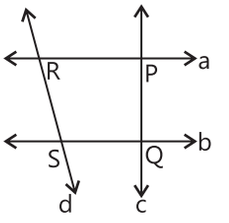


i) Name three pairs of intersecting lines. = **r, q, s**

ii) Name two lines segments = **AB, BC**

iii) What is the point of intersection of line p and r? = **A**

5. From the adjoining figure:



i) Name two parallel lines = **a, b**

ii) Name two perpendiculars lines = **a and c**

iii) Q is the point of interection for which two lines? = **b and c**

iv) Are the lines a and d parallel? = **no**

v) What is the point of intersection of a and d? = **R**

vi) Name four points. = **R, P, S, Q**

6. Identify the geometrical concept.

(i) 

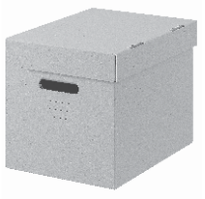
Point

(ii) 

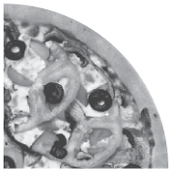
Parallel and perpendicular lines

(iii) 

ray

(iv) 

porellel and perpendicular

(v) 

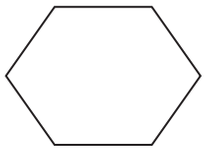
Sector/perpendicular

(vi) 

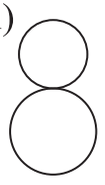
ray

Exercise 10.2

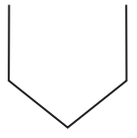
1. Classify as open and closed curve.

i) 

Closed

ii) 

Closed

iii) 

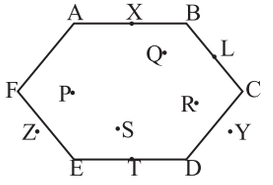
Open

iv) 

Open

2. Draw two simple closed curves.

3. Name the following:



i) Two vertices = **A, B (or, C, D, E, F)**

(ii) Two adjacent sides = **AB, BC (others also)**

iii) Two adjacent vertices = **C, D (other answers also possible)**

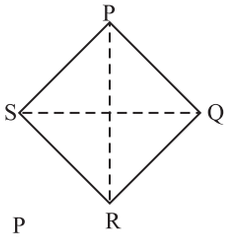
iv) Two interior points = **P/Q/R/S**

v) Two exterior points = **Z, Y**

(vi) Two boundary points = **L, T (or X)**

vii) Is it a closed or open curve? = **closed**

4. Name the following using the figure given alongside.



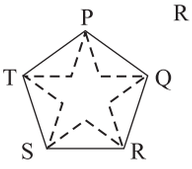
i) Two adjacent sides = **PQ and QR (the answers also possible)**

ii) Two adjacent vertices = **P, Q (or Q, R / R, S / P, S)**

iii) Two opposite sides = **PQ and SR (or, QR and PS)**

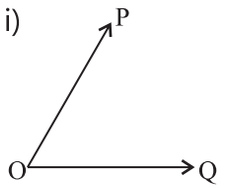
iv) Two diagonals = **PR and SQ**

5. Draw a polygon using 5 points. Label the sides, vertices and diagonal.

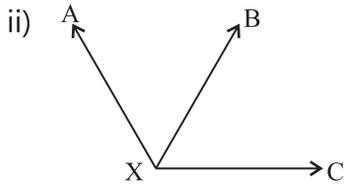


Exercise 10.3

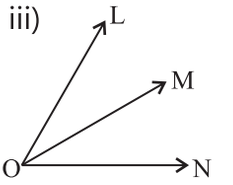
1. Name all the angles.

i) 

∠PQQ

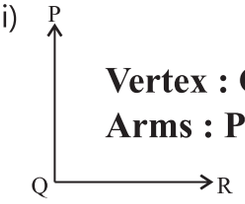
ii) 

∠A × B, ∠B × C, ∠A × C

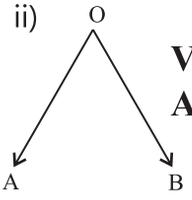
iii) 

∠LOM, ∠MON, ∠NOL

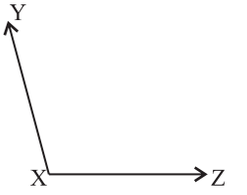
2. Name the vertices and arms of the following angles.

i) 

Vertex : Q
Arms : PQ, QR

ii) 

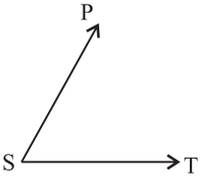
Vertex : O
Arms : OA, OB

iii) 

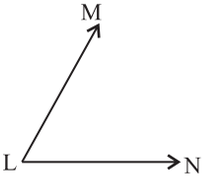
Vertex : X
Arms : XY, XZ

3. Draw and label the angles given below.

i) ∠PST

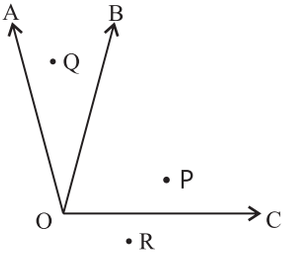


ii) ∠MLN



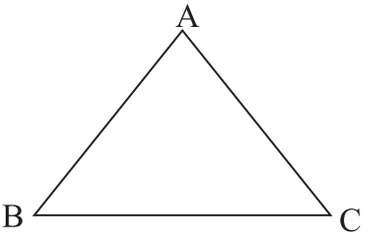
4. From the given figure name the following.

i) two angles = ∠**AOB**, ∠**BOC**
ii) two arms = **OA, OB**
iii) the common arm = **OB**
iv) one exterior point for ∠AOB = **POR**
v) two interior point for ∠AOC = **P,Q**
vi) one exterior point for ∠AOC = **R**



Exercise 10.4

1. Draw a triangle and label its parts.



2. From the adjoining figure:

i) Name the vertices of DPQR. = **P, Q, R**

ii) Name the altitude with side and vertices.

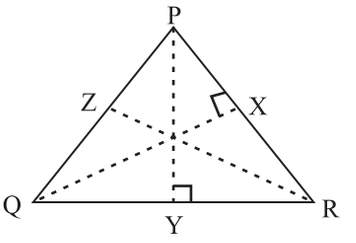
Altitude QX with vertex

Altitude PY with vertex P

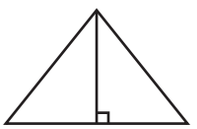
Altitude with vertex R

iii) Name the median with side and vertex.

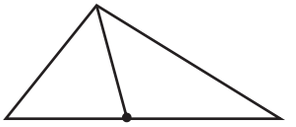
Median = RZ, vertex x, side PQ



3. Draw a figure to show the difference between altitude and median.



Altitude



median

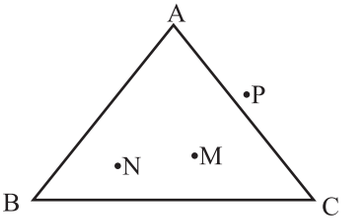
4. From the adjoining figure :

i) Name two sides with vertex B. = **BC, BA**

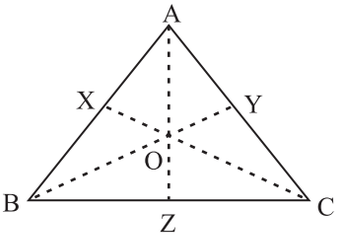
ii) Name two angles with AC as one of the arms. = ∠**BAC,** ∠**BCA**

iii) Name one interior point. = **M/N**

iv) Name one exterior point. = **P**



5. Draw a triangle PQR. Draw the three medians of the triangle. Mark the intersection of the 3 medians as 'O'.



Exercise 10.5

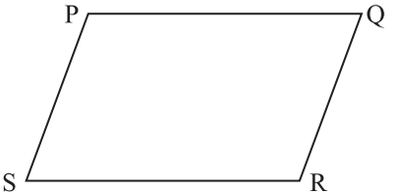
1. From the adjoining figure name the :

i) adjacent sides = **PQ, QR/QR, RS/PS, RS/PS, RS/PS, PQ**

ii) opposite sides = **PQ and RS/QR and PS**

iii) adjacent angles = ∠**P,** ∠**Q /** ∠**Q** ∠**R /** ∠**R,** ∠**S /** ∠**S,** ∠**P**

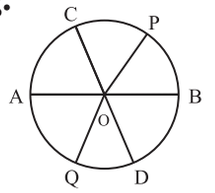
iv) opposite angles = ∠**P,** ∠**R** or ∠**Q,** ∠**S**



2. Draw a quadrilateral and label the angles and sides.

Exercise 10.6

1. Draw a circle and label the following.

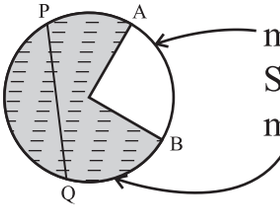


i) centre : **0**

ii) two radii : **OP, OQ**

iii) two diameters : **AB. CD**

2. Draw a circle and label the following.

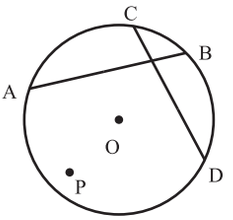


i) major segment :

ii) minor arc :

iii) major sector

3. From the figure name the following:



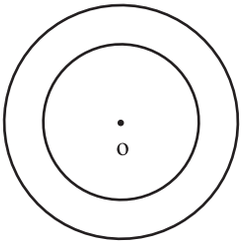
i) two chords = **AB, CD**

ii) two arcs = **AC/AB/BC/BD/AD**

iii) two interior points. = **O and P**

iv) centre = **O**

4. Mark a point O. Draw two circles of radius 4 cm and 5 cm with O as the centre. What kind of circles are these?



concentric circles

6. If the radius of a circle is 5 cm, find the diameter.

radius = 5cm

diameter = 2 × radius

= 2 × 5

= 10 cm

7. The diameter of a circle is 16 cm, find the radius of the circle.

diameter = 16cm

radius = d ÷ 2

$= \frac{16}{2} = 8\,cm$

8. Find the diameter of the circle whose radius is:

i) 2.5 cm

radius = 2 × 2.5

= 5 cm

ii) 4 cm

4 × 2

= 8 cm

iii) 3.8 cm

3.8 × 2

= 7.6 cm

iv) 1.9 cm

1.9

= 3.8 cm

SELF ASSESSMENT-10

1. From the adjoining figure, answer the following.

i) One right angle = **$\angle$AOB**

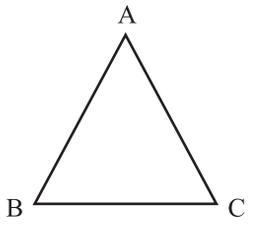
ii) a pair of adjacent = **$\angle$AOB, $\angle$BOC**

iii) one interior point = **P**

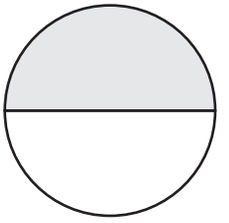
iv) one ray = **$\overrightarrow{OA}$**

v) one arm. = **OB**

2. Draw a triangle and label its vertex.



3. Draw a circle and shade its minor segment.



4. Draw a quadrilateral and label.

i) one pair of adjacent angles

$\angle$A and $\angle$B / $\angle$B and $\angle$C / $\angle$C and $\angle$D / $\angle$D and $\angle$A

ii) one pair of opposite sides

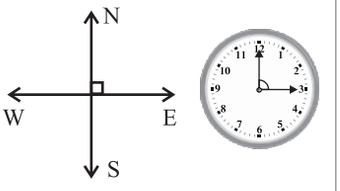
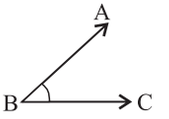
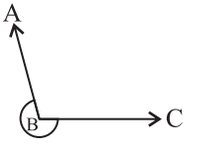
AB and DC / BC and AD

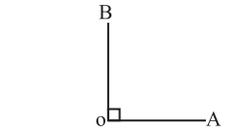
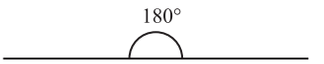
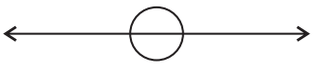
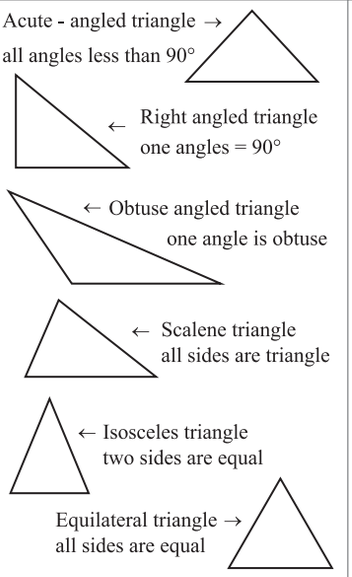
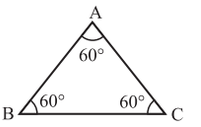
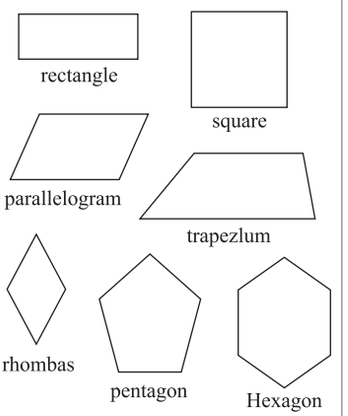
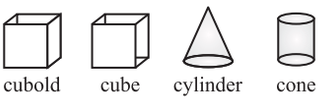
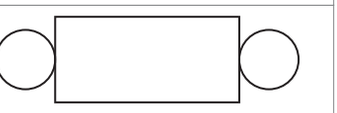
5. Two circles having same centre are called **concentric** circles.
6. A **triangle** is a three sided figures.
   c) triangle
7. Diameter is the **longest** chord of a circle.
   a) longest
8. Two angles of a quadrilateral having a common arm are called **adjacent** angles.
9. A line has **infinite** points.
   c) infinite
10. The **collinear** points lie in one straight line.
    a) collinear

From the above figure, answer the following.

11. One diagonal
    d) AC
12. Two opposite sides
    c) AB and CD
13. One exterior point
    c) Q

Chapter-11 Understanding Elementary Shapes

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Line segment	Students will be able to measure and draw line segments	Ask the students to draw line segments of different measure	
Angels : Right and Straight	To understand the concept of right angle and straight angle. Also understand the shape of each	Explain with diagram what is right angle and what is straight angle. Demonstrate the concepts using 'Directions' and 'Clock'  Each 15 minutes makes a right angle, 30 minutes make straight angle	What angle is formed at 1) 9 : 15 2) 6 : 00
Angles : Acute, Obtuse and Reflex Angle	To understand how to name the angle by comparing with right angle and straight angle.	Less than a right angle.  Between one-fourth and half of a rvolution  More than half of a solution 	What angle is formed at 1) 9 : 15 2) 6 : 00
Complementary and supplementary angles.	Students will be able to identify complementary and supplementary angles and will be able to find the complement/ supplement of an angle	Give pair of angles to students and ask them whether they are complementary or supplementary.	1) Is 18 and 82 complements angles? 2) Find the angle which is the supplement of itself.

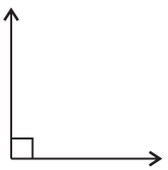
The measure of an angle	To learn how to measure the angle by using protractor	 right angle = 90°  straight angle  complete angle = 360°	
Classificationoftriangles	To understand the name of teh triangles according to their angles and according to their sides		 elassify the triangle based on sides and angles.
Quadrilaterals and Polygons Special quadrilateral and its properties	To understand the different types of quadrilaterals square, rectangle, parallelogram trapezium etc. Also understand the polygons like hexagon heptagon etc.	 Different properties to be discased in class	All rectangles are parallelograms but all parallelograms are not rectangles. Is this true? Justify your answer.
Three Dimensional shapes and nets of some 3-D shapes	To understand the formations of three dimensional shapes or solids.	 Real life objects can be shown and classified at different shapes. Class activity on making nets can be done.	 Can the given net form a cylinder?

Exercise 11.2

1. How is an angle fomed?

An angle is formed when then rays meet at a point or two line segment intersect each other at a point.

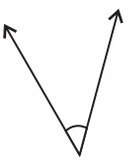
2. Classify as right, acute, obtuse, straight or complete angle.

i) 

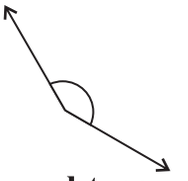
right

ii) 

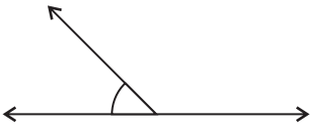
obtuse

iii) 

acute

iv) 

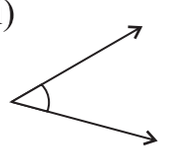
obtuse

v) 

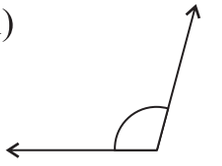
acute

vi) 

straight

vii) 

acute

viii) 

obtuse

3. Give two examples of each (from your surroundings) of the following.

i) acute angle = **pizza pice, hands of clock at 3 : 05 forms acute angle.**

ii) obtuse angle = **hands of clock at 3 : 50, yoga postures form obtuse angle.**

iii) right angle = **edges of a book, edges of cupboard form right angle.**

4. Name two english alphabets each having

i) acute angle = A, Z have acute angles

ii) obtuse angle = X, Y have obtuse angle

iii) right angle. = E, F have right angle

5. Find the complement of

i) $20°$ = Complement of $20° = 90 - 20 = 70°$

ii) $35°$ = Complement of $35° = 90 - 35° = 55°$

6. Find the supplement of

i) $112°$ = Supplement of $112° = 180° - 112° - = 68°$

ii) $157°$ = Supplement of $157 = 180° - 157° = 23°$

7. If two complementary angles are in the ratio 1 : 4, find the angles.

$1x + 4x = 90°$

or, $5x = 90°$

or, $x = 18°$

1st angle $= 1 \times 18 = 18°$

2nd angle $= 4 \times 18 = 72°$

8. Two supplementary angles are in the ratio 1 : 3. Find the angles.

ATP,

$1x + 3x = 180$

or, $4x = 180$

$x = 45°$

1st angle $= 1 \times 45 = 45°$

2nd angle $= 3 \times 45 = 135°$

9. Check if the following angles are complementary, supplementary or none.

i) $20°, 80°$
$= 100°$
neither complementary nor supplementary

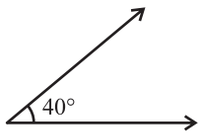
ii) $30°, 150°$
$= 180°$
Supplementary angle

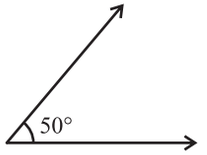
iii) $70°, 90°$
$= 160°$
Neither complementary Nor supplementary

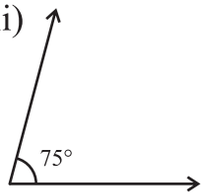
iv) $72°, 18°$
$= 90°$
Complementary angle

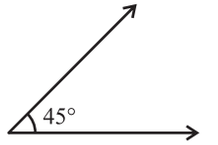
Exercise 11.3

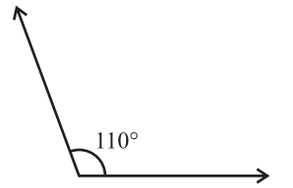
1. Arrange in descending order:

i) 

ii) 

iii) 

iv) 

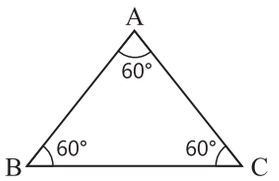
v) 

2. What is the angle made by the hands of the clock at :

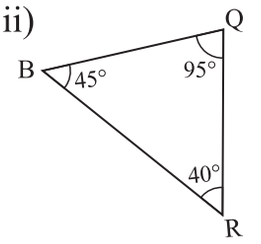
i) 3 : 00 p.m. = 3:00 pm makes 90°
ii) 10 : 05 a.m. = 10:05 am makes 150° (approx)
iii) 5 : 00 p.m. = 5:00 pm makes 150° (approx)
iv) 7 : 30 p.m. = 7:30 pm makes 30° (aprox)

Exercise 11.4

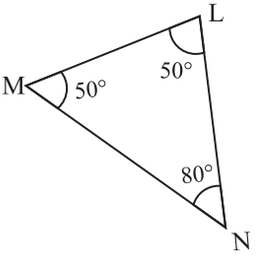
1. Classify the triangles based on angles.

i) 

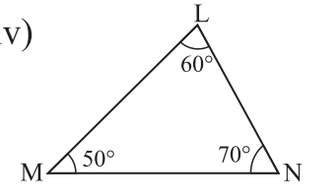
acute angled

ii) 

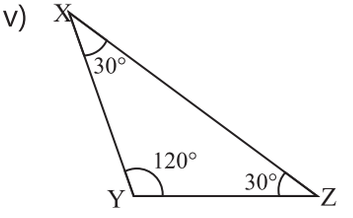
obtuse angled

iii) 

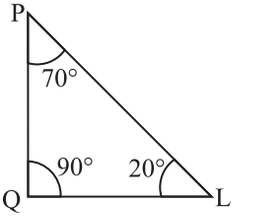
acute angled

iv) 

acute angled

v) 

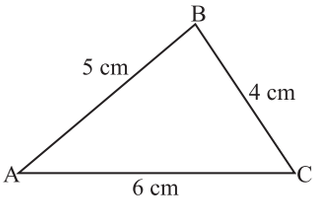
obtuse angled

vi) 

right angled

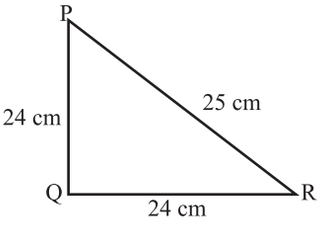
2. Classify the triangles based on sides.

i)



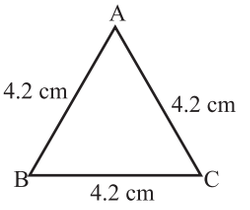
scalene

ii)



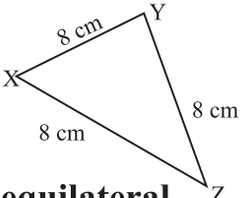
isosceles

iii)



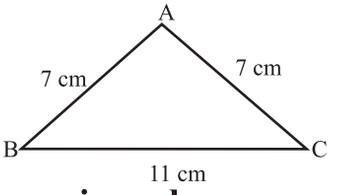
equilateral

iv)



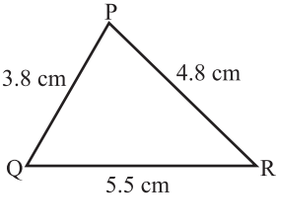
equilateral

v)



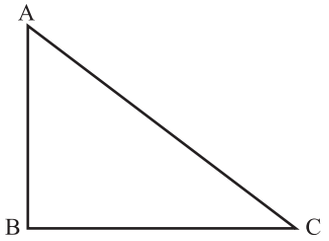
isosceles

vi)

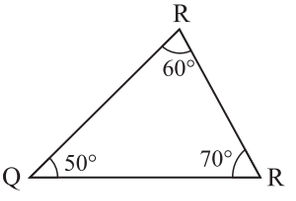


scalene

3. Draw a right angled triangle. Label its sides and vertices.



4. Draw an equilateral triangle. Using a protractor measures all its angles.



5. State true or false:

i) An obtuse angle can have 3 equal angles. **False**

ii) A right angle triangle has one angle as 90°. **True**

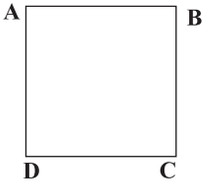
iii) A triangle with three equal sides is called isosceles triangle. **False**

iv) A scalene triangle has all angles equal. **False**

v) An isosceles triangle has two equal sides. **True**

Exercise 11.5

1. Draw a quadrilateral. Label its opposite sides.



3. State whether true/false.

i) The diagonals of a parallelogram bisect each other. **True**

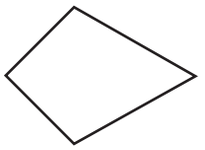
ii) The diagonals of a rhombus are equal. **False**

iii) All sides of a parallelogram are equal in length. **False**

iv) An octagon has 7 sides. **False**

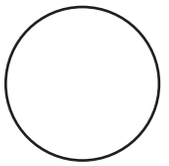
v) Only one angle of a rectangle is a right angle. **False**

4. Identify whether the following figures are polygons or not.



Polygon

i)

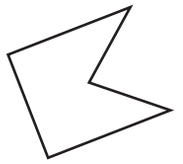


not a polygon

ii)

not a polygon

iii)



polygon

iv)

5. Give two properties of :

i) square
Properties of square
All sides are equal
Diagonals are equal

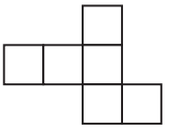
ii) parallelogram
Properties of parellogram
opposite sides of parellelogram are equal and porallel
diagonals bisect each other

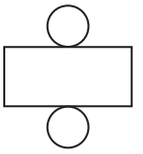
iii) rhombus
Properties of rhombus
all sides are equal
diagonals bisect at 90°

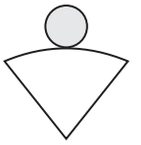
iv) trapezium
Properties of trapezium
one pair of opposite sides are parellel

Exercise 11.6

1. Draw the net for the following.

i) cube 

ii) cylinder 

iii) cone 

2. Complete the table:

Figure	Faces	Vertices	Edges
i) cuboid	6	8	12
ii) cylinder	2 plane face, curved	0	2
iii) cone	1 plane, 1 curved	1	1 curved
iv) sphere	1 plane face	0	0
v) tetrahedron	4	4	0

SELF ASSESSMENT-10

1. Identify the type of triangles and give one other property of it.

i) A triangle with all angles equal = **equilateral triangle**

ii) A triangle will all sides unequal = **scalene triangle**

2. Write true or false.

i) The opposite angles of a parallelogram are equal. **True**

ii) A triangle cannot have more than one right angle. **True**

iii) An obtuse angle triangle can have all angles equal. **False**

iv) An acute angle is more than half a revolution. **False**

3. Fill in the blanks.

i) A square has all angles equal to **90°**.

ii) The diagonal of a rhombus **bisect** each other.

iii) A trapezium has one pair of **parellet** side.

iv) An obtuse angle is **more** than a right angle.

4. Look at a wall clock, at 3 : 00 p.m. the angle formed is **right** angle.

b) right

5. The time at which a straight angle is formed.

c) 6 : 00 p.m.

6. The instrument used to measure angles is

d) protractor

7. A pentagon has **5** sides.

a) 5

8. An equilateral triangle has **3** sides equal.

b) 3

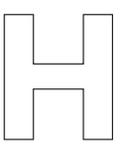
9. A rectangle has **2** pairs of equal sides.

c) 2

10. A cuboid is a **3** dimensional figure.

d) 3

Chapter-12 Symmetry

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Concept of symmetry, Symmetrical figures, figures, with one line symmetry and more than one line of symmetry Symmetry of figures like triangle, square, parellogram Rectangle etc Symmetry of Letters of English alphabet. Concept of vertical and harizontal line of symmetry	The students will be clean with the concept of symmetry. They will be able to identify the lines of symmetry of various figures and letters of english alphabet	Activity of symmetrical figures formation using cut out from double fold can be done. Show the students different cut out of symmetrical figures and fold them to show the line of symmetry	 The above figure has how many line of symmetry? Horizontal/ Vertical line of symmetry?

Rotational symmetry and order of rotational symmetry.	The students will be able to identify she/her a figure for rotational symmetry and order of rotational symmetry	Use cut outs of figures have rotational symmetry and explain the children about order of rotational symmetry. eg. H $\xrightarrow[\text{rotate}]{}$ I $\xrightarrow[\text{rotate}]{}$ H Explain that since H was rotated 2 times to bring it to original form the order is 2.	What is the order of rotational symmetry of scalene triangle

Exercise 12.1

1. How many lines of symmetry do the following have?

i) parallelogram = A parallelogram has **0** line of symmetry.

ii) circle = A circle has infinite lines of symmetry.

iii) rhombus = A rhombus has 2 lines of symmetry.

iv) angle = A angle has 1 line of symmetry.

2. List any 3 symmetrical objects around you.

butterfly, LCD television, man

3. Group the capital letters of english alphabet as having vertical or horizontal line of symmetry.

Horizontal symmetry – B, C, D, E, K, S, H, I, O, X

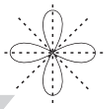
Vertical Symmetry – A, M, T, U, V, W, Y, H, I, O, X

4. Group the number from 0 to 9 as having vertical or horizontal symmetry.

Horizontal symmetry – 1, 3, 8

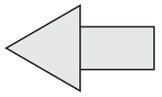
Vertical symmetry – 1, 8

5. Draw the lines of symmetry.

i)  ii) no lines of symmetry iii)  iv) no lines of symmetry

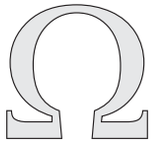
Exercise 12.4

1. Draw the mirror image of the following.

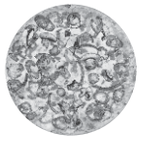
i)  ii)  iii)  iv) 

2. Do the following figures undergo any change under reflectional symmetry.

i)  Yes

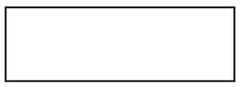
ii)  No

iii)  Yes

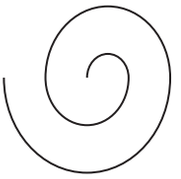
iv)  No

Exercise 12.4

1. Do the following figure show rotational symmetry?

i) 

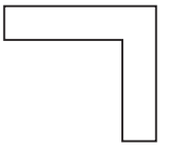
Yes

ii) 

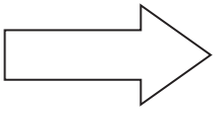
No

iii) 

Yes

iv) 

Yes

v) 

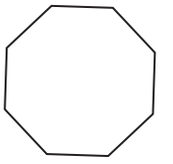
Yes

vi) 

Yes

vii) 

Yes

viii) 

Yes

2. Use the diagrams from question 1 to determine the order and angle of rotational symmetry for the following shapes, if none, write none.

i) Order = **2**
Angle = **180**

ii) Order = **none**
Angle = **none**

iii) Order = **5**
Angle = **72**

iv) Order = **2**
Angle = **180**

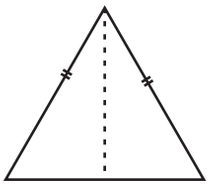
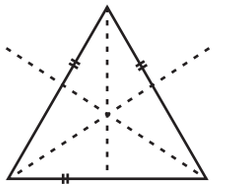
v) Order = **2**
Angle = **180**

vi) Order = **2**
Angle = **180**

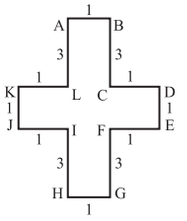
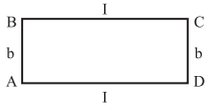
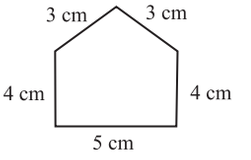
vii) Order = **2**
Angle = **180**

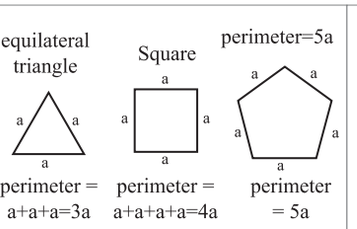
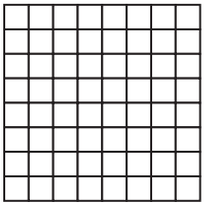
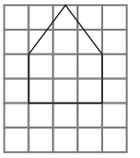
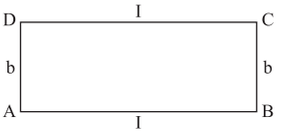
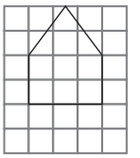
viii) Order = **8**
Angle = **45**

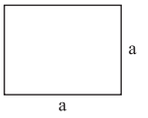
3. Draw a figure that meets the given symmetry requirements. It must have:

i) Line symmetry, but no rotational symmetry.	ii) Rotational symmetry, but no line symmetry.	iii) Exactly 3 lines of symmetry
 **Isosceles triangle**	 **Parellelogram**	 **Equilateral triangle**

Chapter-14 Mensuration

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Introduction:	To understand the basic concepts about perimeter and area	Recollect the ideas about perimeter and area that the children have learned in the last year.	
Perimeter	To understand that the perimeter is the length of the boundary of a closed region.  Perimeter of the given shape = AB+ BC+CD+DE+EF+GH +HI+IJ+JK+KL+LA =1+3+1+1+1+3+1+3+ 1+1+1+3=20cm. Take more questions from the egs as well as exercises and demonstrate the method and make the children able to do the problems  Area of rectangle ABCD = AB + BC + CD + AD = I+b+I+b = 2I+2b = 2 (I+b) Egs the perimeter fo a rectangle whose length is = 3 cm and breadth is 5cm is given by 2(I+b) = 2×8=16cm	Show the children different closed figured to understand the concept of perimeter.	Find the cost of fencing the garden below a 2.5 per m.  Calculate the length of a rectangle colour perimeter is 19cm and breadth is 5 cm.

Perimeter of Regular shapes	Understand the formula to find the perimeter of regular shape.	 Hence the perimeter of a regular shape= no. of sides × length of a side. Give more questions to practice.	What is the perimeter of a regular hexagon of side 5 cm.
Area	Understand the concept of area as the amount of surface enclosed by a closed figure.	Recollect the method of finding the area by counting the squares inside the figure and express the area in square cms or square ms.  The area of the rectangle given in the grid is 18 square cms	Find the area inclosed. 
Area of a Rectangle	Understand the formula of finding the area of a rectangle and able to apply it in different problems.	In the above example it is observed that the length is 6 cms and breadth is 3cms. Then the area is 18 square cms which is equal to Length × breadth  Hence the area of a rectangle = length × breadth = I×b Do problems from the ext book.	Find the area inclosed. 

Area of a Square	Understand the formula of finding the area of a square and able to apply it in different problems	Area of a square = a = a × a Area of a square of side 8 am is 8 × 8 = 64 square cms Do more problems from the text book  	A wire is in the form of a square of side 7 cm. If the same wire is beat to form a rectangle of length 10cm how much area will it enclose?

Exercise 14.1

1. Find the perimeter of the rectangle whose :

i) l = 15 cm; b = 8 cm

Perimeter = 2 × (l + b)

= P = 2 × (15 + 8)

= P = 2 × 23

= P = 46

∴ Perimeter = 46 cm

ii) l = 40 cm ; b = 12 cm

Perimeter = 2 × (22.5 + 14.5)

= P = 2 × 37

= P = 74

∴ Perimeter = 71 m

iii) l = 22.5 m; b = 14.5 m

P = 2 × (40 + 12)

= P = 2 × 52

= P = 104

∴ Perimeter = 46 cm

iv) l = 60 cm ; b = 20 cm

= P = 2 × 37

= P = 74

∴ Perimeter = 74 m

2. Find the perimeter of the square whose side is :

i) 10 cm

Perimeter = 4 × side

= P = 4 × 10

= P = 40 cm

ii) 15 mm

Perimeter = 4 × 15

= 60 cm

iii) 53 cm

Perimeter = 53 × 4

= 212 cm

iv) 12 cm

Perimeter = 4 × 12

= 48 cm

3. Find the perimeter of the triangle whose sides are :

i) 5 cm, 3 cm, 6 cm

P = 5 + 3 + 6

= 14 cm

ii) 7 cm, 8 cm, 9 cm

P = 7 + 8 + 9

= 24 cm

iii) all sides 6 cm

P = 3 × 6

= 18 cm

iv) all sides 0.5 m.

P = 3 × 0.5

= 1.5 m

4. Find the cost of fencing a square garden of sides 2.5 m at the rate of ₹ 10/m.

Perimeter = 2.5×4 m

= 10 m

$\therefore$ Cost = 10×10

= 100

$\therefore$ **Ans.** ₹100

5. Find the length of wire required to fence a rectangular field twice whose length = 4.8 m and breadth = 2.2 m.

Perimeter = $2(l+b)$ = $2(4.8+2.2)$

= 10.56 = 2×7

= 14m

6. Find the cost of fencing a rectangular garden four times with barbed wires at the rate of Rs 45/m, if the length of the field is 10 m and breadth is 8 m.

Perimeter = $2 \times (10+8)$

= 2×18m

= 35m

Length of wire required = 36×4

= 144m

$\therefore$ Cost = 144×45

= ₹6480

7. Find the distance covered by Meena to walk around a triangular park of sides 12m, 12m and 5 m.

P = $12+12+5$

= 29m

$\therefore$ **Ans.** 29m

8. Find the perimeter of :

i) regular pentagon of side 7.2 cm.

P = 7.2×5

= 36 cm

ii) regular hexagon of side 8 mm.

P = 8×6

= 48 mm

iii) regular heptagon of side 5 dm.

P = 5×7

= 35 dm

iv) regular octagon of side 4.7 cm.

P = 4.7×8

= 37.6 cm

9. Eliza walks twice around a square garden of side 10 m and Sidrah walks three times around a rectangular garden of length 4 m and width 2 m. Who walks more and by how much?

Eliza

Distance covered = 2 × Perimeter of the garden

P = $10\text{m} \times 4$

= 40 m

$\therefore$ Distance covered = 40×2

= 80m

Sidrah

Distance covered = 3 × Perimeter of the garden

P = $2 \times (4\text{m} + 2\text{m})$

= 2×6m

= 12m

$\therefore$ Distance covered = $12\text{m} \times 3$

= 36m

$\therefore$ Eliza covers more distance by 80m – 36 = 44m

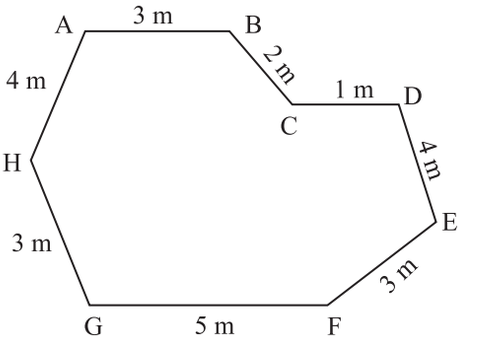
10. Ali walks three times around a triangular park whose each side is 12 m and Sami walks twice around a square park of side 10m. Find who walks less and by how much?

Ali	**Sami**
Distance covered = 3 × Perimeter	Distance covered = 2 × Perimeter
P = 3 × 12m	P = 4 × 10
= 36 m	= 40
∴ Distance covered = 36 × 3	∴ Distance covered = 40m × 2
= 108m	= 80m

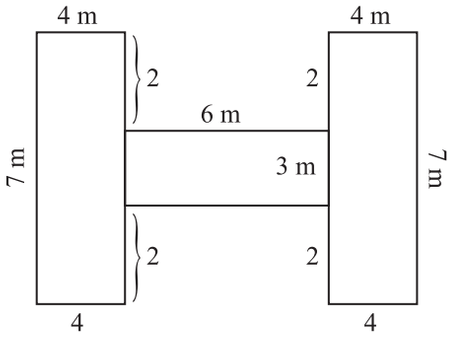
∴ Sami walks less by (108–80) 28m.

11. Find the perimeter of the following:

i) P = AB + BC + CD + DF + EF + FG + GH + HA
= 3m + 2m + 1m + 4m + 3m + 5m + 3m + 4m
= 25m



ii) Perimeter = 7 + 4 + 2 + 6 + 2 + 4 + 7 + 2 + 6 + 2 + 4
= 52m



Exercise 14.2

1. Find the area of the square whose side is:

i) 6 cm
Area = 6 × 6
= 36cm

ii) 25 m
Area = 25 × 25
= 625m^2

iii) 30 cm
Area = 30 × 30
= 900cm^2

iv) 9.2 dm.
Area = 9.2 × 9.2
= 84.64dm^2

2. Find the area of the rectangle whose lengths and breadths are as follows:

i) l = 50 cm, b = 24 cm
Area = 50 × 24
= 1200cm^2

ii) l = 24 m, b = 6 m
Area = 24 × 6
= 144m^2

iii) $l = 160\,dm, \quad b = 35\,dm$

Area $= 160 \times 35$

$= 5600 dm^2$

iv) $l = 65\,m, \quad b = 25\,m$

Area $= 65 \times 25$

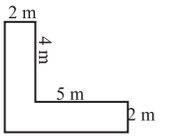
$= 1625 dm^2$

3. Find the area of the following figure:

i) Area $= 2m \times 6m + 5m \times 2m$

$= 12 + 10$

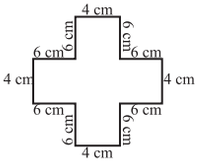
$= 22m^2$



ii) Area $= 3 \times 6 + 5 \times 2 + 3 \times 6$

$= 18 + 10 + 18$

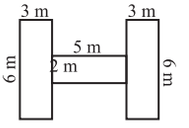
$= 46m^2$



iii) Area $= 4 \times 6 + 16 \times 4 + 6 \times 4$

$= 24 + 64 + 24$

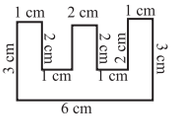
$= 112m^2$



iv) Area $= 1 \times 2 + 2 \times 2 + 1 \times 2 + 6 \times 6$

$= 2 + 4 + 2 + 36$

$= 44cm^2$



4. If the area of a rectangular field is 84 m2 and its length is 14 m find its breadth.

As, Area $= l \times b$

$\therefore \quad l = \frac{2}{1}$

$\Rightarrow$ Breadth $= \frac{\cancel{84}^{\cancel{12}^{6}}}{\cancel{14}_{1}^{2}}$

$= 6m$

5. If the area of a rectangular field is 540 m2 and its breadth is 90m, find its length.

As, Area $= l \times b$

$\therefore$ Length $= \frac{\cancel{54}\cancel{0}}{\cancel{9}\cancel{0}}$

$= 6m$

6. Find the cost of painting two doors each measuring 25m × 15m at the rate of ` 4/m2.

Cost of painting 1 door $= (25m \times 15m) \times 14$

$= 375 \times$

$= ₹1500$

$\therefore$ Cost of painting 2 doors $= 1400 \times 2$

$= 3000$

$\therefore$ **Ans** ₹3000

7. Find the cost of ploughing a square field of side 1.5 km at the rate of ₹ 75/km2.

Cost $= (1.5\ 1.5km) \times ₹75$

$= 2.25 \times 75$

$= ₹168.75$

8. Find the cost of painting 4 walls of a square room whose sides are 3 m at ₹10/m2.

Cost of painting 1 wall = $(3\times3)\times₹10$

$= 9\times10$

$= ₹90$

$\therefore$ Cost of paintinting 4 walls = 90×4

$= ₹360$

$\therefore$ **Ans.** ₹360

9. Find the cost of covering a room floor with tiles at the rate of ₹ 5 if the dimensions of the floor are 20m × 15m and the size of each square tiles is 50cm.

Area of floor = 20×15

$= 300m^2$

$\therefore$ No. of files required = $\frac{300m^2}{50cm}$

$= \frac{\overset{60000}{\cancel{300000}\,\cancel{0}}}{\cancel{5}\,\cancel{0}}$

$= 6000$

$\therefore$ Cost = 6000×5

$= 300000$

Ans. ₹300000

10. How many tiles of side 50 cm × 40 cm is needed to cover a floor measuring 500 m × 400 m.

Area of floor = $500m \times 400m$

$= 200000m^2$

$= 2000000000cm^2$

Area of each file = $50cm \times 40cm$

$= 2000\ cm^2$

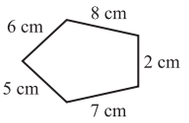
$\therefore$ No of files required = $\frac{\overset{1000000}{\cancel{2000000}\,\cancel{0}\,\cancel{0}\,\cancel{0}}}{2\cancel{0}\,\cancel{0}\,\cancel{0}}$ (1)

$= 1000000$

Ans. 10,00,000 files

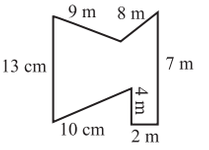
SELF ASSESSMENT-10

1. Find the perimeter of the following:



i) Perimeter = $6+8+2+5+7$

= 28cm



ii) Perimeter = $9m+8m+7m+4+2m+10cm+13cm$

= $9m+8m\,7m+4m+2m+10m+13m$

= 33m

2. Find the area of :

i) square of side 6 cm

Area = 6×6

= $36cm^2$

ii) square of side 12 m

Area = 12×12

= $144m^2$

iii) rectangle whose length = 10 cm, breadth = 7 cm

Area = 10×7

= $70cm^2$

iv) rectangle whose length 25 m, breadth = 3 m

Area = 25×3

= $75cm^2$

3. A wire of 180 cm is bent to form a square. Find the length of the side of the square.

$$\text{Side} = \frac{\text{Perimeter}}{4} = \frac{180}{41}\ \text{cm}$$

4. Find the cost of fencing a rectangular garden whose length is 50 m and beadth is 40 m at the rate of ₹ 5/m.

P = $2\times(50m+40m)$

= $2\times90m$

= 180m

$\therefore$ Cost = $180m\times₹5$

= ₹900

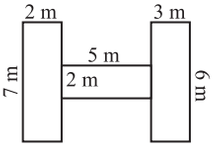
$\therefore$ **Ans.** ₹900

5. Find the area of the following figure:

i) Area = $2\times7+5\times2+3\times6$

= $14+10+18$

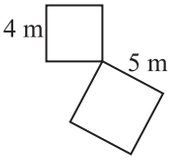
= $42m^2$



ii) Area = $4\times4m+5\times5m$

= $16+25$

= $41m^2$



6. Area of a rectangle is 120 m2. If its length is 24 m, its breadth is

b) 5 m

7. The perimeter of a square is 76 cm. Its side is

a) 19 cm

8. For painting a wall we need the

a) area

9. For fencing a garden we need the

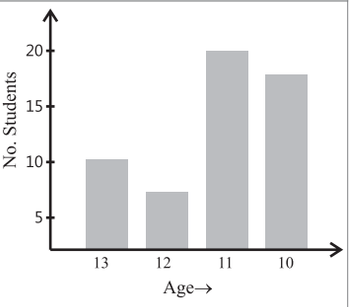
b) perimeter

10. The perimeter of an equilateral triangle is 30 cm. Its side is

c) 10 cm

Chapter-15 Data Handling

Topics	Learning Outcomes	Teaching Learning Activity	Questions on Hots
Introduction: Data, Organizing a data, representing data Organization of Data: Frquency Distribution Table	Understand the concept of data, how the can be collected, how they can be organized, how they can be represented diagrammatically? Able to organize a data in the tabular form called frequency table by using tally marks	Recollect the ideas from the children about the data, different examples etc. Make the children understand how a data can be organized. Give different examples from the daily life. Make the children understand how to put tally marks and what the use of it through different examples is. ❖ In the 1st column write the distinct observations ❖ In the 2nd column put the tally mark against each observation. ❖ In the 3rd column write the total number of tally marks against each observation which is called the frequency of that observation. Egs:- Cosider teh results obtained when a die is tossed 30 times 1 3 5 2 4 6 3 1 2 4 5 6 2 3 2 6 4 5 2 5 4 6 1 3 4 5 6 3 2 3. Observation / Tally marks / Trequency 1 / 111 / 4 2 / 𝍸 1 / 6 3 / 𝍸 1 / 9 4 / 𝍸 / 1 5 / 𝍸 / 5 6 / 𝍸 / 2	

Pictograph (Drawing and interprelation of pictograph)	The students will be able to represent a data by a pictograph and will be able to interpret a pictograph	Explain how to represed a data by a pictograph through different examples. Ask questions based on pictograph.	
Bar Graph (Drawing and interpretation)	Students will be able to draw a bar graph for a given data.	Explain the axes and representation of data on the bar graph. Ask questions based on the bar graph.	 i) How many students are aged 12 yrs. ii) How many students participated in the survey.
Mean and Median	Students will be able to calculate the mean and median of a given set of data.	Collect data from the class. For example, the weight of 10 students of your class. Ask the students to calculate the mean weight and median for the given data.	1) If the total weights of 7 students is 105, what is the mean weight? 2) Calculate the difference of mean and median for the given data 23, 22, 24, 24, 25, 26

Exercise 15.1

1. The following shows the junk food liked by the children in a specific locality. Construct the frequency tally marks.

Pizza, Burger, Burger, Burger, French Fries, Momo, Momo, Pizza, Momo, Pizza, Pizza, French Fries, Burger, Pizza, Momos, Pizza.

Food	Tally Marks	No. of students
Pizza	𝍸 |	6
Burger	||||	4
French fries	||	2
Momo	||||	4

2. Construct the frequency tally marks for the marks obtained by 20 students in class test: 16, 14, 20, 11, 16, 14, 18, 16, 16, 14, 14, 11, 12, 20, 16, 16, 14, 11, 20, 18.

Marks	Tally Marks	No. of students
11	|||	3
12	|	1
14	𝍸	5
16	𝍸 |	6
18	||	2
20	|||	3

3. Construct the frequency distribution table for the following data showing the highest temperature in the month of June.

30, 32, 30, 36, 33, 33, 38, 34, 34, 34, 30, 34, 32, 38, 35, 32, 32, 30, 30, 35, 36, 38, 30, 32, 33.

i) For how many days the temperature was above 35°C? **5 days**

ii) What was the temperature on maximum number of days? **6 days**

Temperature	Tally Marks	No. of days
30	𝍸 I	6
32	𝍸	5
33	III	3
34	IIII	4
35	II	2
36	II	2
38	III	3

4. Construct the frequency tally marks for the number of hours spent on entertainment by the members of a club. 8, 0, 1, 4, 3, 5, 3, 4, 2, 6, 8, 3, 3, 5, 1, 2, 2, 2, 3, 3, 3, 8, 5, 6

i) What is the minimum hour spent on entertainment? **0**

ii) What is the number of members spending 3 hrs on entertainment? **7**

iii) How many members spend less than 2 hrs on entertainment? **3**

Hours	Tally Marks	No. of members
0	I	1
1	II	2
2	IIII	4
3	𝍸 II	7
4	II	2
5	III	3
6	II	2
8	III	3

5. The following table shows the number of chocolates eaten by 4 friends in a week.

Name	Number of chocolates
Aman	
Sid	
Jenny	
Eliz	

i) Who ate maximum chocolates and how many? **Jenny – 3 chocolates**

ii) Which two friend have equal number of chocolates? **Sid and Eliz**

iii) Who ate the least number of chocolate and how many? **Aman- 1 chocolate**

6. The following pictograph shows the number of students present in a class on the different days of a week = 20 students.

Days	Number of students
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

i) When were maximum students present? **Monday**

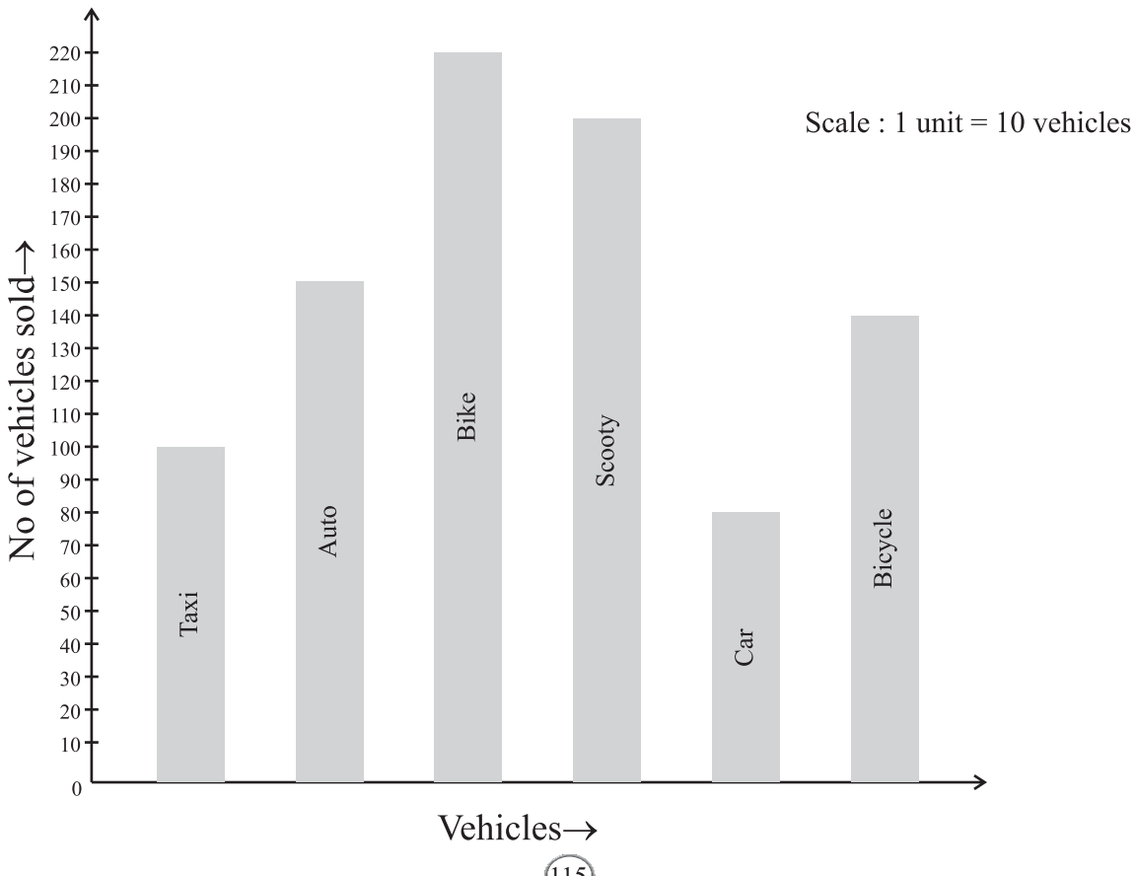
ii) How many students were present on Tuesday? **60**

iii) Which day has 40 students present? **Thursday**

Exercise 15.2

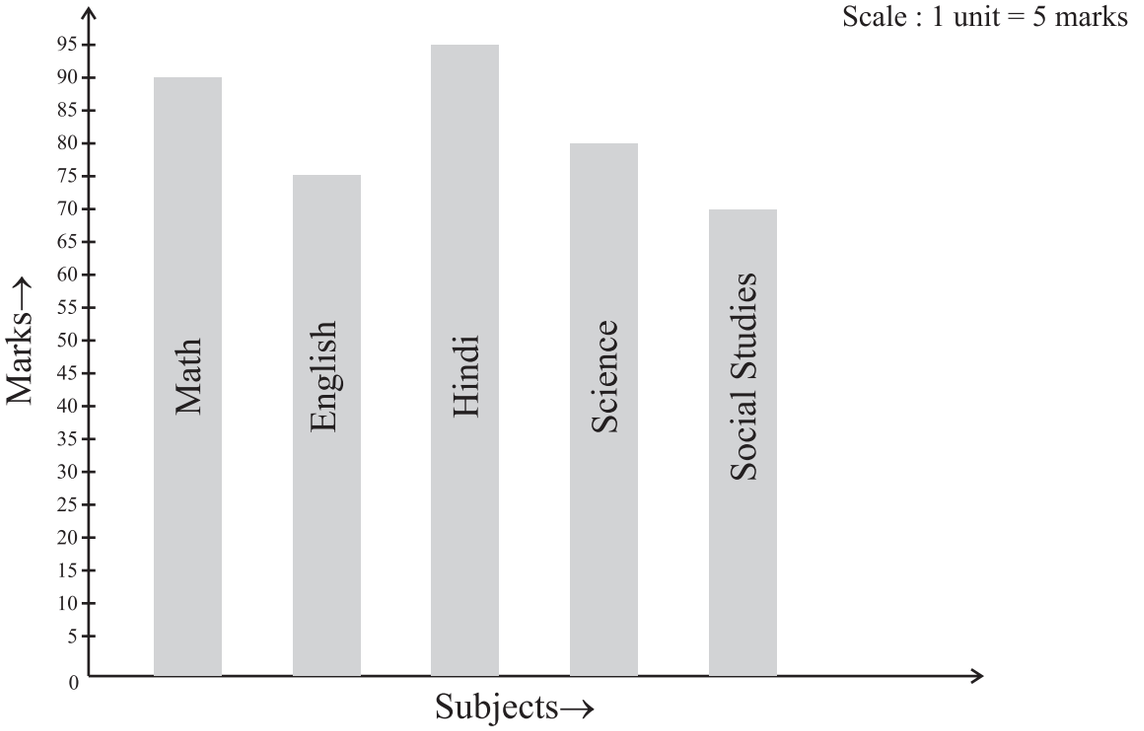
1. Draw a bar graph to represent the sale of various vehicles in the year 2021 in a city. Scale 1 unit = 10 vehicles.

Taxi	Auto	Bike	Scooty	Car	Bicycle
100	150	220	200	80	140



2. Draw a bar graph to represent the marks of Aayush during his half yearly exams. Scale 1 unit = 5 marks.

Math	English	Hindi	Science	Social Studies
90	75	95	80	70



i) What is his favourite subject?

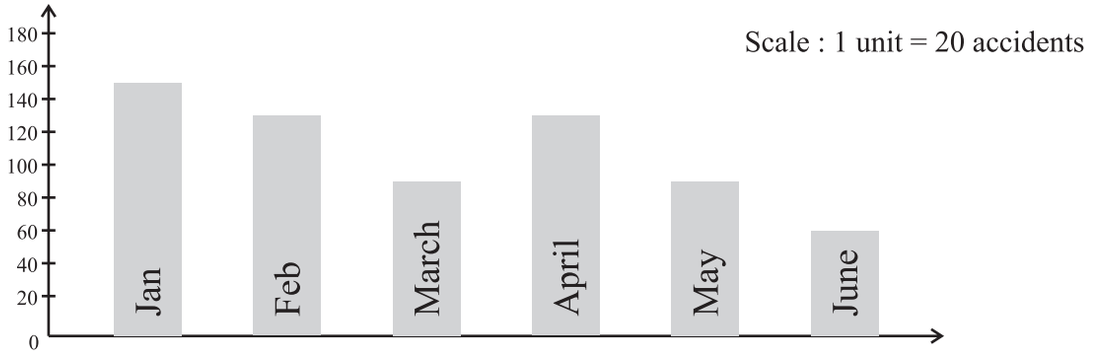
ii) Which subject he needs to work hard?

i) Hindi, can be his favourite subject as he has scared highest.

ii) He needs to work hard in social science.

3. Draw a bar graph to represent the number of accidents in a city in the last 6 months.

Jan	Feb	March	April	May	June
150	130	90	120	90	60



i) Which two months had equal number of accidents?

ii) Which months had more than 90 accidents?

i) March, April

ii) Jan, Feb, April has more than 90 accidents.

4: The coordinator of a school keeps a daily record of absentees from each class. He records this information on a bar graph each week. The graph on the right shows the absentees for each class in one week.

(i) What is shown along the horizontal axis?

Classes are shown in the horizontal axis

(ii) Which classes had the same number of absentees?

IV and V has same number of absentees

(iii) Which class had the most number of absentees?

Class III has the most number of absentees

(iv) Which class has the least number of absentees?

Class II has the least number of absentees.

5: Study the bar graph given and answer the following questions.

(i) What information is given by the bar graph?

The number of different types of trees planted.

(ii) How many trees were planted altogether?

Total 1200 trees were planted

(iii) How many Neem tree were planted?

150 neem trees were planted.

(iv) How many more Gulmohar trees than Peepal trees were planted?

75 more GUlmohar trees were planted

(v) Name the tree which was planted maximum in number?

Apple tree was planted in maximum.

(vi) What is the ratio of the number of Jamun trees planted to the number of Litchi trees planted?

Jamun : Litchi $= \overset{25}{\cancel{128}} : \overset{30}{\cancel{150}}$

$= 5 : 6$

Exercise 15.3

1. Find the mean of :

i) 7, 10, 4 and 17

$$\text{Mean} = \frac{7+10+4+17}{4} = \frac{38}{4} = 9.5$$

ii) 3, 1, 5, 4, 4 and 7

$$\text{Mean} = \frac{3+1+5+4+4+7}{6} = \frac{34}{6} = 4$$

iii) 2.1, 4.5, 5.2, 7.1 and 9.3

$$\text{Mean} = \frac{2.1+4.5+5.2+7.1+9.3}{5}$$

$$= \frac{28.2}{5}$$

$$= 5.64$$

iv) 7,5, 0, 3, 0,6, 0, 9, 1 and 4

$$\text{Mean} = \frac{7+5+0+3+0+6+0+9+1+4}{10}$$

$$= \frac{35}{10} = 3.5$$

v) 5, 2.4, 6.2, 8.9, 4.1 and 3.4

$$\text{Mean} = \frac{5 + 2.4 + 6.2 + 8.9 + 4.1 + 3.4}{6}$$

$$= \frac{30}{6} = 5$$

2. Find the mean of:

i) first ten natural numbers

$$\text{mean of 1st ten natural number} = \frac{1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10}{10} = \frac{55}{10} = 5.5$$

ii) first five even natural numbers

$$\text{mean of first 5 even natural number} = \frac{2 + 4 + 6 + 8 + 10}{5} = \frac{30}{5} = 6$$

iii) first eight odd natural numbers

$$\text{mean of first 8 odd natural numbers} = \frac{1 + 3\ 5 + 7 + 9 + 11 + 13 + 15}{8}$$

$$= \frac{64}{8} = 8$$

iv) all prime numbers upto 20

$$\text{mean of all prime numbers upto 20} = \frac{2 + 3 + 5\ 7 + 11 + 13 + 17 + 19}{8} = \frac{77}{8} = 9.625$$

v) all prime numbers between 30 and 40.

$$\text{mean of all prime numbers between 30 and 40} = \frac{31 + 37}{2} = 34$$

3. Heights (in cm) of 7 boys of a locality are 140 cm, 159cm, 165 cm, 163 cm, 170 cm, 151 cm and 158 cm. Find their mean height.

$$\text{Mean height} = \frac{140 + 159 + 165 + 163 + 170 + 151 + 158}{7}$$

$$= \frac{1106}{7} = 158\text{cm}$$

4. Find the mean of 35, 54, 21, 50, 45, 29, 26, 36, 44 and 40.

$$\text{Mean} = \frac{35 + 54 + 21 + 50 + 45 + 29 + 26 + 36 + 44 + 40}{10}$$

$$= \frac{380}{10} = 38$$

Exercise 15.4

1. Find the median of:

i) 31, 31, 32, 33, 33, 34, 34, 34, 34, 35 and 35

31, 31, 32, 33, 33, 34, 34, 34, 34, 35

since it is already in ascending order and no of terms = odd

median = middle term = 34

ii) 3.2, 4.8, 5.6, 6.5 and 9.1

Data already arranged

middle value is the median = 5.6

iii) 16, 23, 35, 12, 28, 23, 30 and 20

Ascending order = 12, 16, 20, 23, 28, 30, 35

No of data is even, so we have 2 middle value 23 and 23

$$\text{So, median} = \frac{23 + 23}{2} = 23$$

iv) 22, 34, 42, 18, 34, 22, 36, 45 and 28

22, 34, 42, 18, 22, 36, 45, 28

Ascending order = 18, 22, 22, 28, **34**, 34, 42, 45

↑

middle value

Median = 34

v) 82, 45, 64, 68, 75, 52, 45 and 70

82, 45, 64, 68, 75, 52, 45, 70

Ascending order = 45, 45, 52, **64, 68**, 70, 75, 82

Two middle value = 64 and 68

$$\text{Median} = \frac{64 + 68}{2}$$

$$= \frac{132}{2}$$

$$= 66$$

vi) 1, 3, 4, 5, 9, 9 and 11

Already in ascending order

middle value is the median = 5

vii) 10, 12, 12, 15, 16, 17, 18, 18, 18 and 19

$$\text{Median} = \frac{16 + 17}{2}$$

$$= \frac{33}{2} = 16.5$$

SELF ASSESSMENT-15

1. The graph below shows the attendance of students in a school in a week. Study the graph and answer the given questions.

i) When was the attendance minimum?

Attendance was minimum on saturday.

ii) When was the attendance maximum?

Attendance was maximum on wednesday.

iii) For which two days attendance was equal?

Attendance was same on Monday and Friday.

iv) What was the attendance on Thursday?

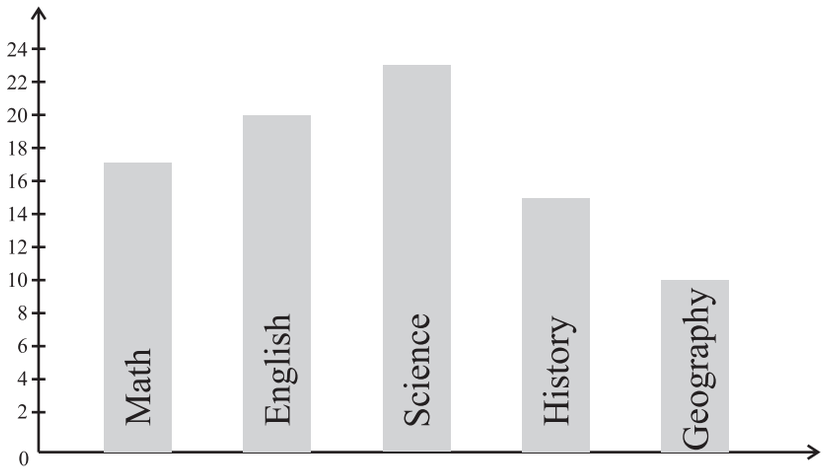
The attendance on thursday was 150.

v) What is the total count of student present during the entire week.

Total count is 850

2. Draw the bar graph for the following data and answer the questions given below.

Subject	Math	English	Science	History	Geography
Number of students	17	20	23	15	10



i) The subject liked by most students.

c) Science

ii) The subject liked less than History.

d) Geography

iii) English is liked by _____ students

b) 20

3. Study the pictograph and answer the following.

i) When was maximum cup cakes sold?

On Thursday

ii) How many cupcakes were sold on Tuesday?

10 + 5 = cupcakes were sold on tuesday

iii) How many cupcakes were sold on Monday and Wednesday together?

Monday = 30

Wednesday = 25

Total = 30 + 25 = 55

4. Calculate the mean and median of the following raw data. 30,32,40,45,28,38.

$$\text{Mean} = \frac{30 + 32 + 40 + 45 + 28 + 38}{6} = 35.5$$

Ascending order = 28, 30, 32, 38, 40, 45

$$\text{median} = \frac{32 + 38}{2}$$

$$= \frac{70}{2}$$

$$= 35$$