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SOLUTION
MAGICAL MATHS

6

Chapter 1. NUMBER SYSTEM

Exercise 1.1

1. (i) Greatest Number = 7501
Smallest Number = 1057

(ii) Greatest Number = 6432
Smallest Number = 2346

(iii) Greatest Number = 9531
Smallest Number = 1359

2. (i) $3 \times 100000 + 6 \times 10000 + 4 \times 1000 + 3 \times 100 + 7 \times 10 + 8 \times 1$

(ii) $4 \times 1000000 + 7 \times 100000 + 8 \times 1000 + 3 \times 100 + 4 \times 10 + 6 \times 1$

(iii) $2 \times 10000000 + 4 \times 1000000 + 4 \times 100 + 3 \times 10 + 2 \times 1$

3. (i) 803525

(ii) 3022036

(iii) 70005006

4. (i) Place value of 7 = 70000
Face value of 7 = 7
Difference = 70000 – 7
= 69993

(ii) Place value of 7 = 700
Face value of 7 = 7
Difference = 700 – 7
= 693

(iii) Place value of 7 = 7000
Face value of 7 = 7
Difference = 7000 – 7
= 6993

5. (i) 9, 68, 432
Nine lakh sixty eight thousand four hundred thirty two.

(ii) 85,34,950
Eighty five lakh thirty four thousand nine hundred fifty.

(iii) 9,99,34,863
Nine crore ninety nine lakh thirty four thousand eight hundred sixty three

6. (i) 675,321
Six hundred seventy five thousand three hundred twenty one

(ii) 67,345,982
Sixty seven million three hundred forty five thousand nine hundred eighty two

(iii) 12,857,329
Twelve million eight hundred fifty seven thousand three hundred twenty nine.

7. (i) 5,000,384 (ii) 14,04,201
(iii) 65,90,003 (iv) 43,15,00,707.

8. (i) 1 lakh = 100 thousand (ii) 1 crore = 100 lakh
(iii) 1 million = 1000 thousand (iv) 1 crore = 10 million
(v) 1 lakh = 10 ten thousand

Execise 1.2

1. (i) 4,76,098 < 4,87,678 (ii) 4,37,560 > 3,50,123
(iii) 2,43,360 = 2,43,360 (iv) 3,50,001 < 3,50,101

2. Ascending order
(i) 35,000; 45,000; 56,400; 64,800 (ii) 85732; 92,354; 1,32,456; 2,59,382

3. Descending order
(i) 9,34,121; 6,12,012; 3,25,408; 13,640
(ii) 4,27,554; 3,84,651; 3,21,157; 98,432; 92,354

Exercise 1.3

1. 1 kl = 1000 litre

5 kl = 5 × 1000
= 5000 litre

2. $1 \text{ cm} = \frac{1}{100} \text{ m}$

$10 \text{ cm} = \frac{10}{100} \text{ m} = 0.10 \text{ metre}$

3. (i) 3m 4 cm in cm
1 m = 100 cm
3 m = 300 cm
∴ 3m 4 cm = (300 + 4) cm = 304 cm

(ii) 6 kg 200 g in g
1 kg = 1000 g
6 kg = 6000 g
∴ 6 kg 200 g = (6000 + 200) g = 6200 g

(iii) 7 km in m
1 km = 1000 m
7 km = 7000 m

4. Total no. of tablets = 50,00,000 × 10
= 5,00,00,000
Total weight of tables = 5,00,00,000 × 25 mg
= 1,25,00,00,000 mg

$$1 \text{ mg} = \frac{1}{1000000} \text{ kg}$$

$$1,25,00,00,000 \text{ mg} = \frac{1,25,00,00,000}{1000000} \text{ kg}$$

= 1250 kg

So, the weight of medicines in kg is 1250.

5. Profit earned in 2011 = ₹ 5,80,000
It increased in 2012 = ₹ 85,450
∴ Total profit = ₹ 5,80,000 + ₹ 85,450
= ₹ 6,65,450
So, the total profit earned by the company is ₹ 6,65,450.

6. No. of teachers in 2016 = 1,13,460
No. of teachers in 2019 = 1,15,800
No. of increased teachers = 1,15,800 – 1,13,460
= 2340
So, no. of increased teachers is 2340.

7. The cost of a laptop = ₹ 35,000
The cost of 20 taptops = ₹ 35,000 × 20
= ₹ 7,00,000
So, the cost of such 20 laptops is ₹ 7,00,000.

8. Total money the dealer has = ₹ 2,50,500
Cost of 15 coolers = ₹ 3000 × 15
= ₹ 45,000
The money left with him = ₹ 2,50,500 − ₹ 45,000
= ₹ 2,05,500
So, after the purchase ₹ 2,05,500 left with him.

9. The required number = 6,42,385 + 3,500
= 6,45,885
So, 6,45,885 is 3500 more than 6,42,385.

10. Distance covered in 4 hours = 282 km 600 m
Distance covered in 1 hour = 282 km 600 m ÷ 4
= 282 k, 600 km ÷ 4

```
   70.650
4)282.600(
  28
  --
   26
   24
  --
    20
    20
  --
     0
```

So, speed of the car is 70 km 650 m per hour.

11. The cost of 15 chairs = ₹ 3870
The cost of 1 chair = ₹ 3870 ÷ 15

```
15)3870(258
   30
  ---
   87
   75
  ---
  120
  120
  ---
    0
```

So, the cost of each chair is ₹ 258.

12. Cost of 213 kg of grapes = ₹ 80 × 213
= ₹ 17,040
Cost of 5132 kg of oranges = ₹ 41 × 5132
= ₹ 2,10,412
Cost of 7139 kg of apples = ₹ 52 × 7139
= ₹ 3,71,228
Total money earned by the fruit seller
= ₹ 17,040 + ₹ 2,10,412 + ₹ 3,71,228
= ₹ 5,98680
So, the total money earned by the fruit seller in a year is ₹ 5,98,680

Exercise 1.4

1. Round off the following numbers :

(i) 34,628 to the nearest tens
= 34,628 is estimated to the nearest tens as 34,630

(ii) 2,15,630 to the nearest hundreds
= 2,15,630 is estimated to the nearest hundred as 2,15,600.

(iii) 17,325 to the nearest thousands
= 17,325 is estimated to the nearest thousands as 17,000.

(iv) 32,156 to the nearest hundreds
= 32,156 is estimated to the nearest hundreds as 32,200.

2. Estimate the following :

(i) 456 + 283
Round off the number 456 = 500
Round off the number 283 = 300
Sum = 500 + 300
= 800

(ii) 796 – 412
Round off the number 796 = 800
Round off the number 412 = 400
Difference = 800 – 400 = 400

(iii) 2134 + 884
Round off the number 2134 = 2000
Round off the number 884 = 900
Sum = 2000 + 900 = 2900

(iv) 14805 – 3885
Round of the number 14805 = 15000
Round of the number 3885 = 4000
difference = 15000 – 4000 = 11000

3. Estimate the following to the nearest thousand

(i) 5275 + 1766 + 22350
Round off the number 5275 (nearest thousand) = 5000
Round off the number 1766 (nearest thousand) = 2000
Round off the number 22350 (nearest thousand) = 22000
Sum = 5000 + 2000 + 22000
= 29000

(ii) 4824 – 1925
Round off the number 4824 (nearest thousand) = 5000
Round off the number 1925 (nearest thousand) = 2000
Difference = 5000 – 2000 = 3000

4. Estimate the following products to the nearest hundreds.

(i) 6592 × 523
Round off the number 6592 (nearest hundred) = 6600
Round off the number 523 (nearest hundred) = 500
Product = 6600 × 500 = 3300000

(ii) 2214 × 1720
Round off the number 2214 (nearest hundred) 2200
Round off the number 1720 (nearest hundred) = 1700
Product = 2200 × 1700
= 3740000

(iii) 23125 × 8831
Round off the number 23125 (nearest hundred) = 23100
Round off the number 8831 (nearest hundred) = 8800
Product = 23100 × 8800
= 203280000

5. Estimate the following quotient :

(i) $97 \div 24$
Round off the number 97 = 100
Round off the number 24 = 20
Quotient = $100 \div 20 = 5$

(ii) $848 \div 39$
Round off the number 848 = 800
Round off the number 39 = 40
Quotient = $800 \div 40 = 20$

(iii) $87 \div 28$
Round off the number 87 = 90
Round off the number 28 = 30
Quotient = $90 \div 30 = 3$

Exercose 1.5

1. Write the mathematic expression for the following :

(i) $36 \div (5 + 4)$ (ii) $(2 \times 9) - 8$

(iii) $(13 \times 15) \div 65$ (iv) $5 \times [(9 \times 15) - (65 + 35)] + 10$

2. Simplify :

(i) $150 - [50 - \{50 - (50 - 50)\}]$
$= 150 - [50 - \{50 - 0\}]$
$= 150 - [50 - 50]$
$= 150 - 0 = 150$

(ii) $15 + (3 - \overline{5 - 3})$
$= 15 + (3 - 2)$
$= 15 + 1 = 16$

(iii) $100 - 3[6 + \{63 - 4(2 \times 6 + 3)\}]$
$= 100 - 3[6 + \{63 - 4(12 + 3)\}]$
$= 100 - 3[6 + \{63 - 4 \times 15\}]$
$= 100 - 3[6 + \{63 - 60\}]$
$= 100 - 3[6 + 3]$
$= 100 - 3 \times 9 = 100 - 27 = 73$

(iv) $81 \times [59 - \{7 \times 6 + (17 - 2 \times 4)\}]$
$= 81 \times [59 - \{42 + (17 - 8)\}]$
$= 81 \times [59 - \{42 + 9\}]$
$= 81 \times [59 - 51] = 81 \times 8 = 648$

3. Correct way of solving $(52 + 3) \times 7$ is = $52 \times 7 + 3 \times 7$

Exercise 1.6

1. Roman numerals :

(i) $15 = 10 + 5 =$ XV (ii) $28 = 20 + 8 =$ XXVIII

(iii) $32 = 30 + 2 =$ XXXII (iv) $95 = 90 + 5 =$ XCV

(v) $163 = 100 + 60 + 3 =$ CLXIII (vi) $310 = 300 + 10 =$ CCCX

2. Hindu Arabic numbers :

(i) XXXI $= 10 + 10 + 10 + 1 = 31$ (ii) XLV $= (50 - 10) + 5 = 45$

(iii) XXVI $= 10 + 10 + 6 = 26$ (iv) CLIV $= 100 + 50 + 4 = 154$

(v) XC $= 100 - 10 = 90$ (vi) LIV $= 50 + 4 = 54$

Chapter 2. WHOLE NUMBERS

Exercise 2.1

1. The natural number that succeeds 20,003
$= 20{,}003 + 1 = 20{,}004$

$\therefore$ The option (iii) is correct.

2. The smallest natural number = 1

$\therefore$ The option (ii) is correct.

3. The Predecessor of largest 2-digit number

$= 99 - 1 = 98$

$\therefore$ The option (i) is correct.

4. Whole numbers between 70 and 90

$= (90 - 70) - 1$

$= 20 - 1 = 19$

5. Write the successor and predecessor of the following :

(i) 20134

successor = $20134 + 1 = 20135$

predecessor = $20134 - 1 = 20133$

(ii) 999

successor = $999 + 1 = 1000$

predecessor = $999 - 1 = 998$

(iii) 10009

successor = $10009 + 1 = 10010$

predecessor = $10009 - 1 = 10008$

(iv) 11111

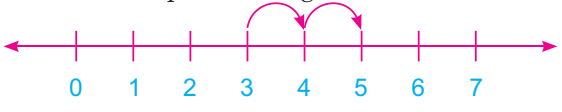
successor = $11111 + 1 = 11112$

predecessor = $11111 - 1 = 11110$

6. Represent the following on the number line.

(i) $3 + 2$

We start from 3 and move 2 steps to the right.



$\therefore$ $3 + 2 = 5$

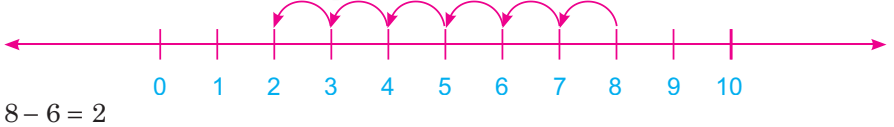
(ii) $7 + 3$

We start from 7 and move 3 steps to the right.

$\therefore$ $7 + 3 = 10$

(iii) $8 - 6$

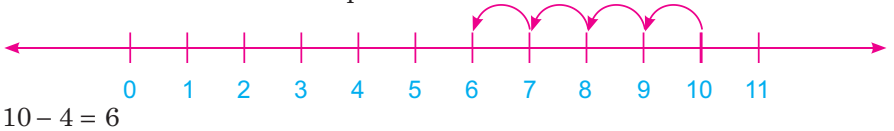
We start from 8 and move 6 steps to the left.



$\therefore$ $8 - 6 = 2$

(iv) $10 - 4$

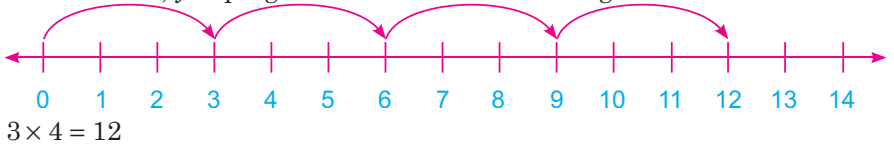
We start from 10 and move 4 steps to the left.



$\therefore$ $10 - 4 = 6$

(v) 3×4

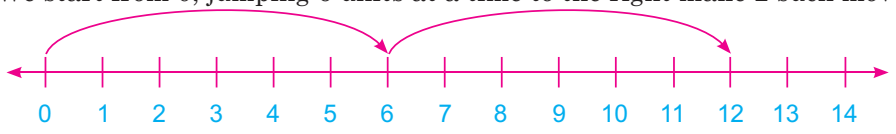
We start from 0, jumping 3 units at a time to the right make 4 such moves.



$\therefore$ $3 \times 4 = 12$

(vi) 6×2

We start from 0, jumping 6 units at a time to the right make 2 such moves



$\therefore \quad 6 \times 2 = 12$

7. State which of the following numbers line on the right of the other number on the number line :

(i) 567 and 235
here, $567 > 235$
so, 567 is right to 235.

(ii) 15 and 25
here, $15 < 25$
so, 25 is right to 15.

(iii) -30 and 10
here $-30 < 10$
so, 10 is right to (-30).

Exercise 2.2

1. Fill in the blanks :

(i) $30086 + 0 = \underline{30086}$

(ii) $1005 \times 285 = 285 \times \underline{1005}$

(iii) $123 + (197 + 63) = (123 + \underline{197}) + 63$

(iv) $496 \times \underline{0} = 0$

(v) $21 \times (15 + 23) = 21 \times 15 + 21 \times \underline{23}$

2. Find the sum by suitable arrangement :

(i) $753 + 607 + 94 + 36$
$= (753 + 607) + (94 + 36)$
$= 1360 + 130 = 1490$

(ii) $853 + 907 + 947$
$= (853 + 947) + 907$
$= 1800 + 907 = 2707$

(iii) $414 + 386 + 520 + 80$
$= (414 + 386) + (520 + 80)$
$= 800 + 600 = 1400$

(iv) $67 + 42 + 33 + 58$
$= (67 + 33) + (42 + 58)$
$= 100 + 100 = 200$

3. Find the product using suitable properties :

(i) $2 \times 1735 \times 50$
$= (2 \times 50) \times 1735$
$= 100 \times 1735 = 173500$ ($\because$ Commutative property)

(ii) $385 \times 5 \times 60$
$= 385 \times (5 \times 60)$ ($\because$ Commutative property)
$= 385 \times 300 = 115500$

(iii) $125 \times 45 \times 8$
$= (125 \times 8) \times 45$ ($\because$ Commutative property)
$= 1000 \times 45 = 45000$

(iv) $50 \times 8 \times 4 \times 250$
$= (50 \times 8) \times (4 \times 250)$ ($\because$ Commutative property)
$= 400 \times 1000$
$= 400000$

4. Find the following using suitable properties :

(i) 535×1002
$= 535 \times (1000 + 2)$ ($\because$ Distributive property)
$= 535 \times 1000 + 535 \times 2$
$= 535000 + 1070 = 536070$

(ii) $163 \times 99 + 163$

$= 163 \times 99 + 163 \times 1$

$= 163 \times (99 + 1)$ ($\because$ Distributive property)

$= 163 \times 100 = 16300$

(iii) $74 \times 96 + 74 \times 4$

$= 74 \times (96 + 4)$ ($\because$ Distributive property)

$= 74 \times 100 = 7400$

(iv) $489 \times 17 - 489 \times 7$

$= 489 \times (17 - 7)$ ($\because$ Distributive property)

$= 489 \times 10$

$= 4890$

(v) $837 \times (1000 - 3)$

$= 837 \times 1000 - 837 \times 3$ ($\because$ Distributive property)

$= 837000 - 2511 = 834489$

(vi) $2528 \times 136 - 2528 \times 36$

$= 2528 \times (136 - 36)$

$= 2528 \times 100 = 252800$ ($\because$ Distributive property)

5. For the values of $a = 15, b = 7$ and $c = 3$

(i) $a \times (b + c) = (a \times b) + (a \times c)$

$15 \times (7 + 3) = (15 \times 7) + (15 \times 3)$

$15 \times 10 = 105 + 45$

$150 = 150$ (True)

(ii) $(a - b) - c = a - (b - c)$

$(15 - 7) - 3 = 15 - (7 - 3)$

$8 - 3 = 15 - 4$

$5 \neq 11$ (False)

(iii) $(a + b) + c = a + (b + c)$

$(15 + 7) + 3 = 15 + (7 + 3)$

$22 + 3 = 15 + 10$

$25 = 25$ (True)

6. Find the value :

(i) $4836 \div 1 = 4836$

(ii) $0 \div 582 = 0$

(iii) $240 \div 6 = 40$

(iv) $976 - 428 \div 428$

$= 976 - 1 = 975$

7. Divide and verify the result by division algorithms :

(i) $6752 \div 58$

```
58) 6752 (116
    58
    ---
    95
    58
    ---
    372
    348
    ---
     24
```

Verification :

Dividend = Divisor × Quotient + Remainder

$6752 = 58 \times 116 + 24$

$= 6728 + 24$

$= 6752$

(ii) $6087 \div 56$

$$\begin{array}{r} 56)6087(108 \\ 56 \\ \hline 487 \\ 448 \\ \hline 39 \end{array}$$

Verification :

Dividend = Divisor × Quotient + Remainder

$6087 = 56 \times 108 + 39$

$= 6048 + 39$

$= 6087$

(iii) $3647 \div 40$

$$\begin{array}{r} 40)3647(91 \\ 360 \\ \hline 47 \\ 40 \\ \hline 7 \end{array}$$

Verification :

Dividend = Divisor × Quotient + Remainder

$3647 = 40 \times 91 + 7$

$= 3640 + 7$

$= 3647$

(iv) $7249381 \div 36$

$$\begin{array}{r} 36)\,7249381(201371 \\ 72 \\ \hline 49 \\ 36 \\ \hline 133 \\ 108 \\ \hline 258 \\ 252 \\ \hline 61 \\ 36 \\ \hline 25 \end{array}$$

Verification :

Dividend = Divisor × Quotient + Remainder

$7249381 = 36 \times 201371 + 25$

$= 7249356 + 25$

$= 7249381$

8. Paurav deposited money in his account = ₹ 35000

Paurav withdrew money from his account = ₹ 15425

Left money = ₹ 35000 – ₹ 15425 = ₹ 19575

So, ₹ 19575 left in Pavrav's account

9. The smallest 4-digit number = 1000

Now,

$$\begin{array}{r} 35)1000(28 \\ 70 \\ \hline 300 \\ 280 \\ \hline 20 \end{array}$$

$35 - 20 = 15$

$\therefore \quad (1000 + 15) = 1015$

So, 1015 is the smallest 4-digit number which is exactly divisible by 35.

10. The greatest 4-digit number = 9999
Smallest 3-digit number = 100
Required number = 9999×100
= 999900

11. Canteen charges for 20 days for lunch = ₹ 25×20 = ₹ 500
Canteen charges for 20 days for tea = ₹ 7×20
= ₹ 140
Total money spent by an employee on these items = ₹ 500 + ₹140
= ₹ 640
So, the money spent by the employee on these for 20 days is ₹ 640.

12. The cost of a chair = ₹ 160
The cost of 20 chairs = ₹ 160×20 = ₹ 3200
The cost of a table = ₹ 400
The cost of 35 tables = ₹ 400×35
= ₹ 14000
∴ total amount of the bill = ₹ 3200 + ₹14000
= ₹ 17,200
So, the total amount of the bill is ₹ 17,200.

13. The cost price of 38 computers = ₹ 1,49,492
The cost price of a computer = ₹ 1,49,492 ÷ 38

```
38)149492(3934
   114
   ---
   354
   342
   ---
    129
    114
    ---
     152
     152
     ---
      ×
     ---
```

So, the cost of a computer is ₹ 3,934.

14. Given Divisor = 62
Quotient = 94
Reminder = 39
Dividend = ?
Dividend = Divisor × Quotient + Remainder
= $62 \times 94 + 39$
= $5828 + 39$
= 5867
So, the required number is 5867.

15. (i) True (ii) False (iii) True

Exercise 2.3

1. Find the value of the following by patterns :

(i) $147 + 9$
$= 147 + 10 - 1$
$= 157 - 1 = 156$

(ii) $638 + 99$
$= 638 + 100 - 1$
$= 738 - 1 = 737$

(iii) $217 - 99$
$= 217 - 100 + 1$
$= 117 + 1 = 118$

(iv) $1516 - 999$
$= 1516 - 1000 + 1$
$= 516 + 1 = 517$

2. Find the product by 5, 25 and 125 using the pattern :

(i) $48 \times 5,\ 48 \times 25,\ 48 \times 125$

$$48 \times 5 = 48 \times \frac{10}{2} = \frac{480}{2} = 240$$

$$48 \times 25 = 48 \times \frac{100}{4} = \frac{4800}{4} = 1200$$

$$48 \times 125 = 48 \times \frac{1000}{8} = \frac{48000}{8} = 6000$$

(ii) $824 \times 5, 824 \times 25, 824 \times 125$

$$824 \times 5 = 824 \times \frac{10}{2} = \frac{8240}{2} = 4120$$

$$824 \times 25 = 824 \times \frac{100}{4} = \frac{82400}{4} = 20600$$

$$824 \times 125 = 824 \times \frac{1000}{8} = \frac{824000}{8} = 103000$$

3. Study the following pattern and write next four steps:

$1 \times 8 + 1 = 9$
$12 \times 8 + 2 = 98$
$123 \times 8 + 3 = 987$
$1234 \times 8 + 4 = 9876$
$12345 \times 8 + 5 = 98765$
$123456 \times 8 + 6 = 987654$
$1234567 \times 8 + 7 = 9876543$
$12345678 \times 8 + 8 = 98765432$

4. Observe the following pattern and find missing numbers :

$15873 \times 7 \times 1 = 111111$
$15873 \times 7 \times 2 = 222222$
$15873 \times 7 \times 3 = 333333$
$15873 \times 7 \times 4 = 444444$
$15873 \times 7 \times 5 = 555555$

5. Complete the following magic squares

8		6
	5	
		2

Sum of diagonal's numbers $= 8 + 5 + 2 = 15$
so, in row 1 (missing number) $= 15 - (8 + 6)$
$= 15 - 14 = 1$
Now, in column 3 (missing number) $= 15 - (6 + 2)$
$= 15 - 8 = 7$
so, in row 2 (missing number) $= 15 - (5 + 7)$
$= 15 - 2 = 3$
Now, in column 1 (missing number) $= 15 - (8 + 3)$
$= 15 - 11 = 4$

so, in row 3 (missing number) = 15 – (4 + 2)
= 15 – 6 = 9

Hence, complete magic square

8	1	6
3	5	7
4	9	2

(ii)

10	5	12
4		7

sum of numbers in row 1 = 10 + 5 + 12 = 27
so, in column 3 (missing number) = 27 – (12 + 7)
= 27 – 19 = 8
in column 1 (missing number) = 27 – (10 + 4)
= 27 – 14 = 13
Now, in row 2 (missing number) = 27 – (13 + 8)
= 27 – 21
= 6
Now, in row 3 (missing number) = 27 – (4 + 7)
= 27 – 11
= 16

Hence, complete magic square

10	5	12
13	6	8
4	16	7

Chapter 3. FACTORS AND MULTIPLES

Exercise 3.1

1. Write the factors of the following:

(i) 20

factors of 20

$1 \times 20 = 20$
$2 \times 10 = 20$
$4 \times 5 = 20$

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

(iii) 48

factors of 48

$1 \times 48 = 48$
$2 \times 24 = 48$
$3 \times 16 = 48$
$4 \times 12 = 48$
$6 \times 8 = 48$

So, factors of 48 are 1, 2, 3, 4, 6, 8, 12, 16, 24 and 48.

(ii) 36

factors of 36

$1 \times 36 = 36$
$2 \times 18 = 36$
$3 \times 12 = 36$
$4 \times 9 = 36$
$6 \times 6 = 36$

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

(iv) 144

Factors of 144

$1 \times 144 = 144$
$2 \times 72 = 144$
$3 \times 48 = 144$
$4 \times 36 = 144$
$6 \times 24 = 144$
$8 \times 18 = 144$
$9 \times 16 = 144$
$12 \times 12 = 144$

So, the factors of 144 are 1,2,3,4,6,8,9,12,16,18,24,36,48,72 and 144.

2. Write the first five multiples of

(i) 9

First five multiples of 9

$9 \times 1 = 9$
$9 \times 2 = 18$
$9 \times 3 = 27$
$9 \times 4 = 36$
$9 \times 5 = 45$

So, the first five multiples of 9 are 9,18,27,36 and 45.

(ii) 13

First five multiples of 13

$13 \times 1 = 13$ $13 \times 3 = 39$ $13 \times 5 = 65$
$13 \times 2 = 26$ $13 \times 4 = 52$

So, the first five multiples of 13 are 13,26,39,52 and 65.

(iii) 11

First five multiples of 11

$11 \times 1 = 11$
$11 \times 2 = 22$
$11 \times 3 = 33$
$11 \times 4 = 44$
$11 \times 5 = 55$

So, the first five multiples of 11 are 11,22,33,44 and 55.

(iv) 25

First five multiples of 25

$25 \times 1 = 25$
$25 \times 2 = 50$
$25 \times 3 = 75$
$25 \times 4 = 100$
$25 \times 5 = 125$

So, the first five multiples of 25 are 25,50,75,100 and 125.

3. Write the next four multiples of 6 after 36.

Next four multiples of 6 after 36.

$6 \times 7 = 42$
$6 \times 8 = 48$
$6 \times 9 = 54$
$6 \times 10 = 60$

So, the next four multiples of 6 after 36 are 42,48,54 and 60.

4. Fill in the blanks :

(i) The first multiple of every number is itself.

(ii) Every number is a factor of itself.

(iii) A number which is twice the sum of all its factors is known as perfect number.

(iv) 2 is the smallest even prime number.

(v) 1 is neither prime nor composite number.

5. Write the multiples of 2 between 81 and 91.

Multiples of 2 between 81 and 91 are 82,84,86,88,90

6. 30, 60 and 90 are the numbers less than 100, and are the multiples of 2,3 and 5.

7. Which of the following is a prime number?

(i) 51

$51 = 3 \times 17$

So, 51 has 3 and 17 as factors other than 1 and 51. Thus 51 is not a prime number.

(ii) 31

$31 = 1 \times 31$

So, 31 has only 1 and 31 as factors. Thus, 31 is a prime number.

(iii) 93

$93 = 3 \times 31$

So, 93 has 3 and 31 as factors other than 1 and 93. Thus, 93 is not a prime number.

(iv) 96

$96 = 2 \times 48 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$

So, 96 has 2 and 3 as factors other than 1 and 96. Thus, 96 is not a prime number.

8. Find the prime numbers between 1 and 30.

The prime numbers between 1 and 30 are

2,3,5,7,11,13,17,19,23,29

9. Is every pair of co-prime numbers a twin prime? Give two examples to support your answer.

Solution : No, every pair of co-prime numbers is not a twin prime
because, 2 and 3 are co-prime but like twin prime they do not differ by 2.
Similarly 4 and 9 are co-prime but the difference of 4 and 9 is not 2.

10. Express 32 and 56 as the sum of two odd primes.

$32 = 29 + 3$

$56 = 53 + 3$

11. Express 63 and 21 as the sum of three odd numbers

$63 = 3 + 17 + 43$

$21 = 3 + 5 + 13$

12. How many prime numbers between 1 and 100 have their unit digit as 9 ?

The prime numbers between 1 and 100 have their unit digit as 9 are

19, 29, 59, 79, 89

Exercise 3.2

1. Test the divisibility of the following numbers :

(i) 5620 by 2

We know that a number is divisible by 2, if its units digit is divisible by 2.
In the given number 5620, its units digit is 0 which is divisible by 2.
So, 5620 is divisible by 2.

(ii) 8413 by 8

We know that a number is divisible by 8, if the number formed by its last three digits is divisible by 8.

In the given number 8413, its last three digits 413 is not divisible by 8.

So, 8413 is not divisible by 8.

(iii) 3578 by 9

We know that a number is divisible by 9, if the sum if its digits is divisible by 9.

In the given number 3578, sum of its digits $(3 + 5 + 7 + 8 = 23)$ is not divisible by 9.

So, 3578 is not divisible by 9.

(iv) 2052 by 4

We know that a number is divisible by 4, if the number formed by its last two digits is divisible by 4.

In the given number 2052, last two digits 52 is divisible by 4.

So, 2052 is divisible by 4.

(v) 69883 by 11

We know that a number is divisible by 11, if the difference of the sum of alternate digits and sum of remaining digits is either 0 or divisible by 11.

In the given number 69883

Difference $= (6 + 8 + 3) - (9 + 8)$

$= 17 - 17 = 0$

So, 69883 is divisible by 11.

(vi) 32520 by 6

We know that a number is divisible by 6, if it is divisible by 2 and 3 both because

$6 = 2 \times 3$.

In the given number 32520, its units digit is 0 so 32520 is divisible by 2.

Now sum of its digits $(3 + 2 + 5 + 2 + 0 = 12)$ is also divisible by 3.

So, 32520 is divisible by 6.

2. Determine which of the following numbers are divisible by 5 and by 10 both.

(i) 895

In the given number 895, its units digit is 5, so 895 is divisible by 5.

But its units digit is not 0, so it is not divisible by 10.

(ii) 430

In the given number 430 its units digit is 0, which is divisible by 5 and 10 both.

(iii) 2100

In the given number 2100, its units digit is 0, which is divisible by 5 and 10 both.

3. Determine the following numbers which is divisible by 11.

(i) 48205

According to the divisibility rule of 11,

difference $= (4 + 2 + 5) - (8 + 0)$

$= 11 - 8 = 3$

which is not divisible by 11.

So, 48205 is not divisible by 11.

(ii) 838310

According to the divisibility rule of 11,

Difference = $(8 + 8 + 1) - (3 + 3 + 0)$

$= 17 - 6 = 11$

which is divisible by 11.

So, 838310 is divisible by 11.

(iii) 6116

According to the divisibility rule of 11.

Difference = $(6 + 1) - (1 + 6)$

$= 7 - 7 = 0$

which is divisible by 11

So, 6116 is divisible by 11.

4. Fill in the blanks with the smallest digit so that the following numbers are divisible by 4.

(i) 48 … 0

We know that a number is divisible by 4, if the number formed by its last two digits is divisible by 4.

Here, in 48…0, if we write 2 in the blank space, the number formed by last two digits is 20, which is divisible by 4.

So, 4820 is divisible by 4.

(ii) 588…2

We know that a number is divisible by 4, if the number formed by its last two digits is divisible by 4.

Here, in 588…2, if we write 1 in the blank space, the number formed by last two digits is 12, which is divisible by 4.

So, 58812 is divisible by 4.

5. Fill in the blanks with the smallest digit so that the following numbers are divisible by 11 :

(i) 87…62

According to the divisibility rule of 11, the difference of the sum of alternate digits and remaining digits should be 0 or divisible by 11.

Here, $8 + \quad + 2 + = 10 + \quad$ and $7 + 6 = 13$

So, to make it divisible by 11, we write 3 in the blank space; then difference

$= 13 - 13 = 0$

which is divisible by 11.

So, 87362 is divisible by 11

(ii) 527…19

According to the divisibility rule of 11, the difference of the sum of alternate digits and remaining digits should be 0 or divisible by 11.

Here, $5 + 7 + 1 = 13$ and $2 + \quad + 9 = 11 +$

So, to make it divisible by 11, we write 2 in the blank space; then difference

$= 13 - 13 = 0$

which is divisible by 11

So, 527219 is divisible by 11.

6. True or False

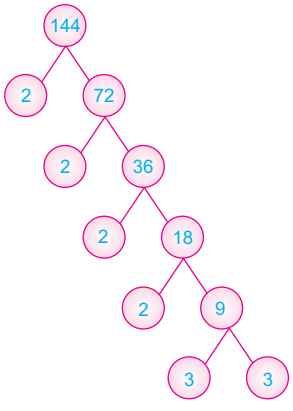
(i) False (ii) False (iii) True (iv) True

Exercise 3.3

1. Make the factor tree for the following numbers :

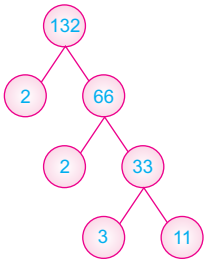
(i) 144

Factor tree of 144 is



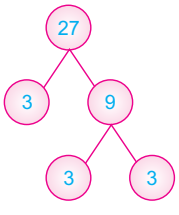
(ii) 132

Factor tree of 132 is



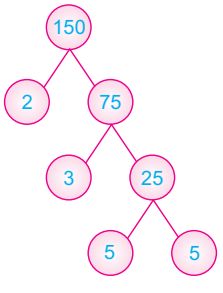
(iii) 27

Factor tree of 27 is



(iv) 150

Factor tree of 150 is



2. Find the prime factorisation by division method :

(i) 725

5	725
5	145
29	29
	1

Prime factors of $725 = 5 \times 5 \times 29$

(ii) 1260

2	1260
2	630
3	315
3	105
5	35
7	7
	1

Prime factors of $1260 = 2 \times 2 \times 3 \times 3 \times 5 \times 7$

(iii) 540

2	540
2	270
3	135
3	45
3	15
5	5
	1

Prime factors of 540 = $2 \times 2 \times 3 \times 3 \times 3 \times 5$

(ii) 2145

3	2145
5	715
11	143
13	13
	1

Prime factors of 2145 = $3 \times 5 \times 11 \times 13$

3. Write the smallest and greatest four digit numbers and express them as a product of prime factors.

Greatest 4-digit number = 9999

Prime factors of 9999 = $3 \times 3 \times 11 \times 101$

3	9999
3	3333
11	1111
101	101
	1

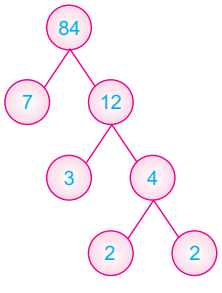
Now, smallest 4-digit number = 1000

Prime factors of 1000 = $2 \times 2 \times 2 \times 5 \times 5 \times 5$

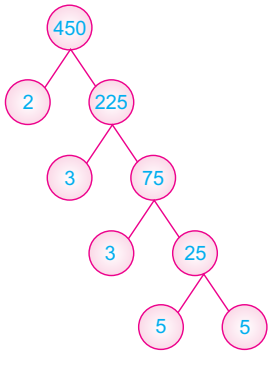
2	1000
2	500
2	250
5	125
5	25
5	5
	1

4. Complete the following factor trees :

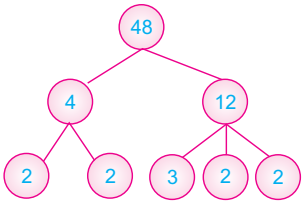
(i) 84



(ii) 450



(iii) 48



5. No, because for example, 60 is divisible by both 4 and 6 but it is not divisible by 24.

Exercise 3.4

1. Write all the common factors of :

(i) 20, 45

Factors of 20 = 1, 2, 4, 5, 10, 20

Factors of 45 = 1, 3, 5, 9, 15, 45

Common factors of 20 and 45 = 1 and 5

(ii) 27, 63

Factors of 27 = 1, 3, 9, 27

Factors of 63 = 1,3,7,9,21,63

Common factors of 27 and 63 = 1, 3 and 9

(iii) 24, 32 and 40

Factors of 24 = 1,2,3,4,6,8,12,24

Factors of 32 = 1,2,4,8,16,32

Factors of 40 = 1,2,4,5,8,10,20,40

Common factors of 24, 32 and 40 = 1,2,4 and 8

2. Find the HCF of the following numbers by prime factorisation method :

(i) 24, 36

2	24
2	12
2	6
3	3
	2

2	36
2	18
3	9
3	3
	1

Prime factors of 24 = $2 \times 2 \times 2 \times 3$

Prime factors of 36 = $2 \times 2 \times 3 \times 3$

HCF of 24 ad 36 = $2 \times 2 \times 3 = 12$

(ii) 28, 35, 49

2	28
2	14
7	7
	1

5	35
7	7
	1

7	49
7	7
	1

Prime factors of 28 = $2 \times 2 \times 7$

Prime factors of 35 = 5×7

Prime factors of 49 = 7×7

HCF of 28, 35 and 49 = 7

(iii) 170, 238

2	170
5	85
17	17
	1

2	238
7	119
17	17
	1

Prime factors of $170 = 2 \times 5 \times 17$
Prime factors of $238 = 2 \times 7 \times 17$
HCF of 170 and 238 = 17.

(iv) 120, 144, 200
Prime factors of $120 = 2 \times 2 \times 2 \times 3 \times 5$ Prime factors of $144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$
Prime factors of $200 = 2 \times 2 \times 2 \times 5 \times 5$
So, HCF of 120, 144 and 200
$= 2 \times 2 \times 2 = 8$

2	120
2	60
2	30
3	15
5	5
	1

2	144
2	72
2	36
2	18
3	9
3	3
	1

2	200
2	100
2	50
5	25
5	5
	1

3. Find the HCF of the following numbers by repeated division method.

(i) 117, 81

$$\begin{array}{r} 81\overline{)117}(1 \\ 81 \\ \hline 36\overline{)81}(2 \\ 72 \\ \hline 9\overline{)36}(4 \\ 36 \\ \hline \times \end{array}$$

So, HCF of 117 and 81 = 4

(ii) 91, 112, 49
First find the HCF of 91 and 112

$$\begin{array}{r} 91\overline{)112}(1 \\ 91 \\ \hline 21\overline{)91}(4 \\ 84 \\ \hline 7\overline{)21}(3 \\ 21 \\ \hline \times \end{array}$$

$\therefore$ HCF of 91 and 112 = 7
Now, find the HCF of 7 and 49

$$\begin{array}{r} 7\overline{)49}(7 \\ 49 \\ \hline \times \end{array}$$

So, HCF of 91, 112 and 49 = 7

(iii) 56, 28, 36
First find the HCF of 56 and 28

$$\begin{array}{r} 28\overline{)56}(2 \\ 56 \\ \hline \times \end{array}$$

$\therefore$ HCF of 56 and 28 = 28
Now, Find the HCF of 28 and 36

$$\begin{array}{r} 28\overline{)36}(1 \\ 28 \\ \hline 8\overline{)28}(3 \\ 24 \\ \hline 4\overline{)8}(2 \\ 8 \\ \hline \times \end{array}$$

So, HCF of 56, 28 and 36 = 4

(iv) 96, 240

$$96)240(2$$
$$\underline{192}$$
$$48)96(2$$
$$\underline{96}$$
$$\times$$

$\therefore$ HCF of 96 and 240 = 48

4. The required largest length of tape will be HCF of 7 m, 3 m 85 cm and 12 m 95 cm.
First find HCF of 7, 385 and 1295 by prime factorization

7	7
	1

5	385
7	77
11	11
	1

5	1295
7	259
37	37
	1

$\therefore$ HCF of 7, 385 and 1295 = 7
Hence, the required length of tape is 7m.

2. Here, the required largest number is HCF of
445 – 4 = 441
572 – 5 = 567
699 – 6 = 693
First find HCF of 441 and 567

$$441)567(1$$
$$\underline{441}$$
$$126)441(3$$
$$\underline{378}$$
$$63)126(2$$
$$\underline{126}$$
$$\times$$

$\therefore$ HCF = 63
Now, HCF of 63 and 693

$$63)693(11$$
$$\underline{63}$$
$$\underline{63}$$
$$\times$$

So, HCF of 441, 567 and 693 = 63
Hence, the required number is 63.

6. The maximum value of weight will be HCF of 39 and 105.

$$39)105(2$$
$$\underline{78}$$
$$27)39(1$$
$$\underline{27}$$
$$12)27(2$$
$$\underline{24}$$
$$3)12(4$$
$$\underline{12}$$
$$\times$$

So, HCF of 39 and 105 = 3
Hence, the maximum value of weight of fertilizer is 3 kg.

7. Maximum no. of students who can sit in a bus is the HCF of 260, 208 and 156.

$$156)208(1$$
$$156$$
$$\overline{52)156\,(3}$$
$$156$$
$$\overline{\times}$$

HCF of 156 and 208 = 52

Now,

$$52)260(5$$
$$260$$
$$\overline{\times}$$

So, HCF of 260, 208 ad 156 = 52

Hence, the maximum number of students who can sit in a bus is 52.

Total no. of students = 156 + 208 + 260 = 624

No. of buses required = $\frac{624}{52} = 12$

Exercise 3.5

1. Find the first three common multiples of

(i) 10, 20

Multiples of 10 = 10, 20, 30, 40, 50, 60, 70, 80, 90, 100,...

Multiples of 20 = 20, 40, 60, 80, 100,...

∴ First three common multiples = 20, 40 and 60.

(ii) 6, 8

Multiples of 6 = 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72,...

Multiples of 8 = 8, 16, 24, 32, 40, 48, 56, 64, 72, 80,...

∴ First three common multiples = 24, 48 and 72

(iii) 4, 12 and 16

Multiples of 4 = 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48,...

Multiples of 12 = 12, 24, 36, 48, 60, 72, 84, 96, 108,...

Multiples of 16 = 16, 32, 48, 64, 80, 96, 112,...

First three common multiples = 48, 96 and 144.

2. Find the LCM by prime factorization method :

(i) 48, 60

2	48
2	24
2	12
2	6
3	3
	1

2	60
2	30
3	15
5	5
	1

Factors of 48 = $2 \times 2 \times 2 \times 2 \times 3$

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

LCM of 48 and 60

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

$= 240$

(ii) 12, 15

2	12
2	6
3	3
	1

3	15
5	5
	1

Factors of $12 = 2 \times 2 \times 3$
Factors of $15 = 3 \times 5$
LCM of 12 and $15 = 2 \times 2 \times 3 \times 5$
$= 60$

(iii) 4, 15 and 10

2	4
2	2
	1

3	15
5	5
	1

2	10
5	5
	1

Factors of $4 = 2 \times 2$
Factors of $15 = 3 \times 5$
Factors of $10 = 2 \times 5$
LCM of 4,15 and $10 = 2 \times 2 \times 3 \times 5$
$= 60$

(iv) 15, 20 and 25

3	15
5	5
	1

2	20
2	10
5	5
	1

5	25
5	5
	1

Factors of $15 = 3 \times 5$
Factors of $20 = 2 \times 2 \times 5$
Factors of $25 = 5 \times 5$
LCM of 15, 20 and $25 = 2 \times 2 \times 3 \times 5 \times 5$
$= 300$

3. The required number will be LCM of 16, 18, 24 and 36

2	16, 18, 24, 36
2	8, 9, 12, 18
2	4, 9, 6, 9
2	2, 9, 3, 9
3	1, 9, 3, 9
3	1, 3, 1, 3
	1, 1, 1, 1

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

4. The least number divisible by 24, 18, 40 and 60 is their LCM.

2	24, 18, 40, 60
2	12, 9, 20, 30
2	6, 9, 10, 15
3	3, 9, 5, 15
3	1, 3, 5, 5
5	1, 1, 5, 5
	1, 1, 1, 1

$\therefore$ LCM of 24, 18, 40 and 60

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

$= 360$

The required number $= 360 + 8$

$= 368$

So, 368 is the least number which when divided by 24, 18, 40, and 60 will leave the remainder 8.

5. The required time will be the LCM of 15, 20 and 30.

2	15, 20, 30
2	15, 10, 15
3	15, 5, 15
5	5, 5, 5
	1, 1, 1

$\therefore$ LCM of 15, 20 and 30

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

$= 60$ minutes

$\therefore$ The required time, when they all chime together again is 10 A.M. + 60 minutes = 11A.M.

6. The required time will be the LCM of 48, 72 and 108.

2	48, 72, 108
2	24, 36, 54
2	12, 18, 27
2	6, 9, 27
3	3, 9, 27
3	1, 3, 9
3	1, 1, 3
	1, 1, 1

$\therefore$ LCM of 48, 72 and 108

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

$= 432$ seconds

$= 7$ minutes 12 seconds

So, the traffic lights will change after 7 minutes 12 seconds.

Exercise 3.6

1. HCF of two numbers = 13

LCM of two numbers = 981

One of two numbers = 117

Other number = ?

$\therefore$ HCF $\times$ LCM = Product of two numbers

$13 \times 981 = 117 \times$ Second number

$$\text{Second number} = \frac{13 \times 981}{117}$$

$$= \frac{981}{9} = 109$$

$\therefore$ So, the other number is = 109

2. HCF of two numbers = 16
Product of two numbers = 3072
LCM of two numbers = ?
$\therefore$ HCF × LCM = Product of two numbers
$16 \times \text{LCM} = 3072$
$$\text{LCM} = \frac{3072}{16} = 192$$
So, the LCM of two numbers is 192.

3. HCF of two numbers = ?
LCM of two numbers = 420
Product of two numbers = 3360
$\therefore$ HCF × LCM = Product of two numbers
$\text{HCF} \times 420 = 3360$
$$\therefore \quad \text{HCF} = \frac{3360}{420} = 8$$
So, the HCF of two numbers is 8.

4. Since 15 is not a factor of 200, so the numbers can not have 15 as HCF and 200 as LCM. The reason for this assumption is that the HCF of the given numbers is always a factor of their LCM.

5. (i) 14, 21

$$\begin{array}{r} 14\overline{)21}(1 \\ 14 \\ \hline 7\overline{)14}(2 \\ 14 \\ \hline \times \end{array}$$

$\Rightarrow$ HCF of 14 and 21 = 7

2	14, 21
3	7, 21
7	7, 7
	1, 1

$\therefore$ LCM of 14 and 21 = $2 \times 3 \times 7 = 42$
Now, HCF × LCM = Product of two numbers
$7 \times 42 = 14 \times 21$
$294 = 294$

(ii) 25, 65

$$\begin{array}{r} 25\overline{)65}(2 \\ 50 \\ \hline 15\overline{)25}(1 \\ 15 \\ \hline 10\overline{)15}(1 \\ 10 \\ \hline 5\overline{)10}(2 \\ 10 \\ \hline \times \end{array}$$

HCF of 25 and 65 = 5

5	25, 65
5	5, 13
13	1, 13
	1, 1

$\therefore$ LCM of 25 and 65 = $5 \times 5 \times 13 = 325$

Now,

HCF × LCM = Product of two numbers

$5 \times 325 = 25 \times 65$

$1625 = 1625$

(iii) 117, 221

$$117\overline{)221}(1$$
$$117$$
$$\overline{104}\overline{)117}(1$$
$$104$$
$$\overline{13}\overline{)104}(8$$
$$104$$
$$\overline{\times}$$

$\Rightarrow$ HCF of 117 and 221 = 13

3	117, 221
3	39, 221
13	13, 221
17	1, 17
	1, 1

LCM of 117 and 221 = $3 \times 3 \times 13 \times 17$

$= 1989$

Now,

HCF × LCM = Product of two numbers

$13 \times 1989 = 117 \times 221$

$25857 = 25857$

Chapter 4. INTEGERS

Exercise 4.1

1. (i) 15 km South

(ii) Increase in rainfall by 10 mm

(iii) Spending of ₹ 1000

(iv) Going 2 km towards the west

2. (i) –208 (ii) 135 (iii) 4096

3. (i) $-4 < 0$ (ii) $-25 > -65$ (iii) $20 > -23$ (iv) $-105 > -110$

(v) $-100 < 200$

4. (i) The integers lying between –5 and 5 are

$-4, -3, -2, -1, 0, 1, 2, 3, 4$

(ii) The integers lying between 0 and –6 are

$-1, -2, -3, -4, -5$

(iii) The integers lying between –10 and –19 are
$-11, -12, -13, -14, -15, -16, -17, -18$

5. (i) Successor of 132 = 132 + 1 = 133
Predecessor of 132 = 132 – 1 = 131
(ii) Successor of 0 = 0 + 1 = 1
Predecessor of 0 = 0 – 1 = –1
(iii) Successor of –9 = –9 + 1 = –8
Predecessor of –9 = –9 – 1 = –10
(iv) Successor of –57 = –57 + 1 = –56
Predecessor of –57 = –57 – 1 = –58

6. Arrange the following in ascending order :
(i) $-30, -11, -7, 16, 20$ (ii) $-102, -95, -61, 100, 501$

7. Arrange the following in descending order :
(i) $73, 0, -37, -68, -86$ (ii) $321, -123, -132, -213, -312$

8. (i) five integers greater than –95 are
$-94, -93, -92, -91, -90$
(ii) five integers less than –22
$-23, -24, -25, -26, -27$

9. (i) 8

(ii) –6

(iii) –1

(iv) 2

10. (i) –10 and 6 ⇒ here, $-10 < 6$
So, 6 is to the right of –10 on number line
(ii) 0 and 6
⇒ here, $0 < 6$
So, 6 is to the right of 0 on number line
(iii) –5 and –16
⇒ here, $-5 > -16$
So, –5 is to the right of –16 on number line
(iv) 3 and –1
⇒ here, $3 > -1$
So, 3 is to the right of –1 on number line

11. (i) the absolute value of 8 = $|8| = 8$
(ii) the absolute value of –4 = $|-4| = 4$
(iii) the absolute value of 26 = $|26| = 26$
(iv) the absolute value of –56 = $|-56| = 56$

12. (i) the next two integers in
$-8, -6, -4, \ldots = -2, 0$

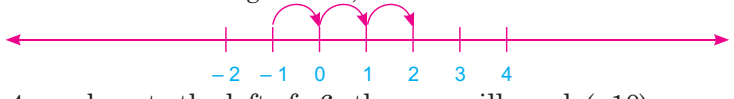
(ii) the next two integers in
$-84, -72, -60, \ldots = -48, -36$

(iii) the next two integers in
$-50, -60, -70, \ldots = -80, -90$

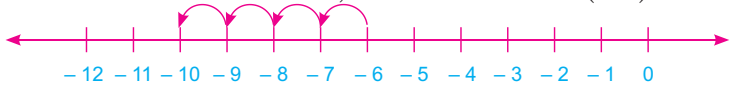
13. In the given number line

here, $A \to -6$, $B \to -5$, $C \to -4$,
$D \to -3$, $E \to -2$, $F \to -1$,
$G \to -0$, $H \to 1$, $I \to 2$,
$J \to 3$, $K \to 4$, $L \to 5$,
$M \to 6$, $N \to 7$, $O \to 8$,
and $P \to 9$.

14. (i) If we move 3 numbers to the right of -1, then we will reach 2.



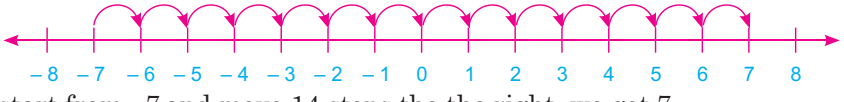
(ii) If we move 4 numbers to the left of -6, then we will reach (-10).



Exercise 4.2

1. (i) $-7 + 14$

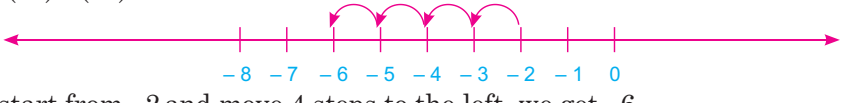
$\therefore$ $-7 + 14 = 7$



We start from -7 and move 14 steps the the right, we get 7.

(ii) $(-2) + (-4)$

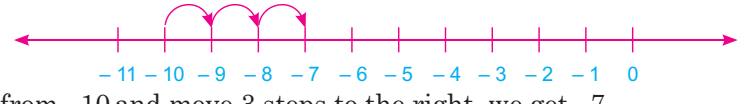
$\therefore$ $(-2) + (-4) = -2 - 4 = -6$



We start from -2 and move 4 steps to the left, we get -6

(iii) $(-10) + 3$

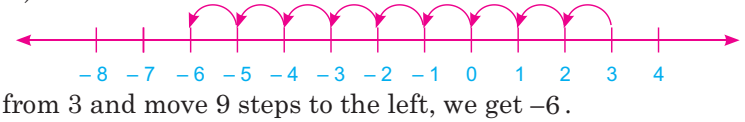
$\therefore$ $-10 + 3 = -7$



We start from -10 and move 3 steps to the right, we get -7.

(iv) $3 + (-9)$

$\therefore$ $3 + (-9) = 3 - 9 = -6$



We start from 3 and move 9 steps to the left, we get -6.

2. (i) $-500, -80$
$= (-500) + (-80)$
$= -500 - 80 = -580$

(ii) $-256, 150$
$= (-256) + 150$
$= -256 + 150 = -106$

(iii) $-315, -100$
$= (-315) + (-100)$
$= -315 - 100 = -415$

(iv) $-45, 28$
$= (-45) + 28$
$= -45 + 28 = -17$

3. Fill ups

(i) $-81 + \boxed{0} = -81$

(ii) $(-23) + (-5) = (-5) + \boxed{-23}$

(iii) $-20 + \boxed{-20} = -40$

(iv) $(-1) + [(-2) + (-3)]$
$= [(-1) + (-2)] + \boxed{-3}$

4. (i) $58 + (-3) + (-66)$
$= 58 - 3 - 66$
$= 55 - 66$
$= -11$

(ii) $30 + (-47) + (-60) + 12$
$= 30 - 47 - 60 + 12$
$= -17 - 60 + 12$
$= -77 + 12 = -65$

(iii) $100 + (-66) + 34$
$= 100 - 66 + 34$
$= 34 + 34$
$= 68$

(iv) $-623 + (-583) + 623$
$= -623 - 583 + 623$
$= -1206 + 623$
$= -583$

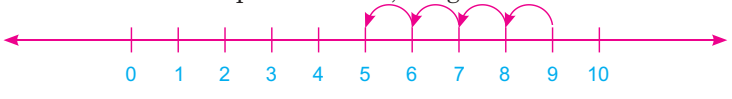
5. Sum of two integers $= -223$
One of two intgers $= 127$
Other integer $= x$ (Let)
First integer + second integer $= -223$
$127 + x = -223$
$x = -223 - 127$
$x = -350$
So, the second intetger is -350

6. Temperature in the moring $= 35°\,C$
Temperature dropped at night $= 7°\,C$
$\therefore$ temperature at night $= 35° - 7°\,C$
$= 28°\,C$

7. (i) True (ii) True (iii) False (iv) False

Exercise 4.3

1. (i) $9 + (-4)$
$\therefore$ $9 + (-4) = 9 - 4 = 5$
We start from 9 ad move 4 steps to the left, we get 5.

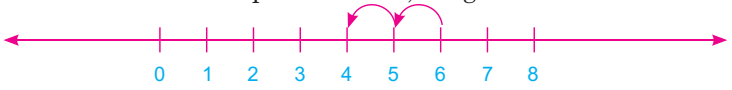


(ii) 6 less than 5
$6 + (-5)$
$= 6 - 5 = 1$
We start from 6 and move 5 steps to the left, we get 1.

(iii) $6 - 2$

$\therefore \quad 6 - 2 = 4$

We start from 6 and move 2 steps to the left, we get 4.



2. (i) $-16, -15$

Subtract (-16) from (-15)

$= -15 - (-16)$

$= -15 + 16 = 1$

(ii) $-200, -100$

Subtract (-200) from (-100)

$= -100 - (-200)$

$= -100 + 200 = 100$

(iii) $-812, 315$

Subtract (-812) from 315

$= 315 - (-812)$

$= 315 + 812 = 1127$

(iv) $500, -457$

Substract 500 from (-457)

$= -457 - 500$

$= -957$

3. (i) $-15 + 34 - 14 - 6$

$= 19 - 14 - 6$

$= 5 - 6$

$= -1$

(ii) $412 + (-98) + (-84) + 7$

$= 412 - 98 - 84 + 7$

$= 314 - 84 + 7$

$= 230 + 7$

$= 237$

(iii) $-410 + (-36) - 23$

$= -410 - 36 - 23$

$= -446 - 23$

$= -469$

(iv) $84 + (-99) + 63 - (-20)$

$= 84 - 99 + 63 + 20$

$= -15 + 63 + 20$

$= 48 + 20 = 68$

4. Nidhi's total score $= 35 + (-5) + (-10) + 20$

$= 35 - 5 - 10 + 20$

$= 30 - 10 + 20$

$= 20 + 20 = 40$

So, Nidhi scored 40 marks in quiz.

5. Sum of -2250 and $938 = -2250 + 938$

$= -1312$

Sum of 2136 and $-272 = 2136 + (-272)$

$= 2136 - 272$

$= 1864$

Now, difference $= 1864 - (-1312)$

$= 1864 + 1312 = 3176$

6. Subtraction of -18 from 5

$= 5 - (-18)$

$= 5 + 18 = 23$

Subtraction of 5 from -18

$= -18 - 5 = -23$

Both the results are not some

7. (i) $(-6)+(-3)$ $\boxed{<}$ $(-13)-(-7)$

$\Rightarrow$ $-6-3$ $-13+7$

-9 $<$ -6

(ii) $(-5)+5$ $\boxed{=}$ $(-15)+15$

$-5+5$ $-15+15$

0 $=$ 0

(iii) $(-19)+20$ $\boxed{>}$ $(-63)+(-10)$

$-19+20$ $-63-10$

1 $>$

(iv) $(-21)+(-30)$ $\boxed{<}$ $(-6)-(-3)$

$-21-30$ $-6+3$

-51 $<$ -3

Chapter 5. FRACTIONS

Exercise 5.1

1. (i) $\frac{7}{16}$

$\Rightarrow$ 7 = Numerator

16 = Denominator

(ii) $\frac{15}{35}$

$\Rightarrow$ 15 = Numerator

35 = Denominator

(iii) $\frac{1}{8}$

$\Rightarrow$ 1 =Numerator

8 = Denominator

(iv) $\frac{8}{9}$

$\Rightarrow$ 8 = Numerator

9 = Denominator

2. (i) five-eighths = $\frac{5}{8}$

(ii) nine-thirteenths = $\frac{9}{13}$

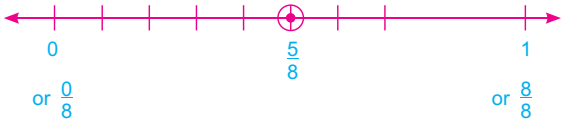
(iii) three-sevenths = $\frac{3}{7}$

(iv) Sixteen-hundredths = $\frac{16}{100}$

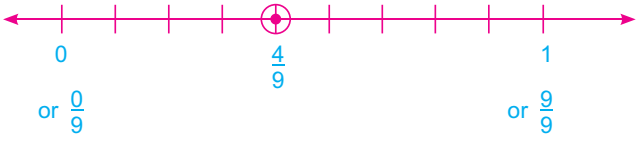
3. (i) $\frac{2}{4}$ (ii) $\frac{5}{10}$ (iii) $\frac{1}{5}$ (iv) $\frac{3}{8}$

4. (i) $\frac{2}{7}$

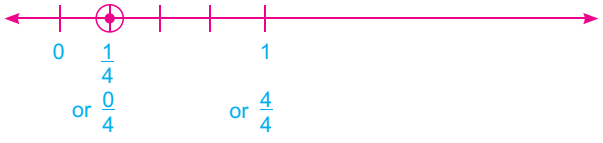
(ii) $\frac{5}{8}$



(iii) $\frac{4}{9}$



(iv) $\frac{1}{4}$



5. What fraction of :

(i) a day is 6 hours

1 day = 24 hours

$\therefore$ fraction = $\frac{6 \text{ hours}}{24 \text{ hours}} = \frac{6}{24} = \frac{1}{4}$

(ii) an hour is 15 minutes

1 hour = 60 minutes

$\therefore$ fraction = $\frac{15 \text{ minutes}}{60 \text{ minutes}} = \frac{5}{60} = \frac{1}{4}$

(iii) a week is 3 days

a week = 7 days

$\therefore$ fraction = $\frac{3 \text{ days}}{7 \text{ days}} = \frac{3}{7}$

6. Total no. of balls = 20

Number. of red balls = 10

Number. of green balls = 3

Number. of blue balls = $20 - (10 + 3) = 7$

fraction of red balls = $\frac{10}{20} = \frac{1}{2}$

fraction of green balls = $\frac{3}{20}$

fraction of blue balls = $\frac{7}{20}$

7. Total Number = 6

Members in the first team = 3

No. of girls in the first team = 2

Members in the second team = 3

Number of girls in the second team = 2

$\therefore$ fraction of the girls in the first team = $\frac{2}{3}$

8. Natural numbers 91 to 100 are

91, 92, 93, 94, 95, 96, 97, 98, 99, 100

Prime number is 97 (only)

Fraction of Prime numbers = $\frac{1}{10}$

9. Total no. of stamps Nishi has = 28

She gave to Niru = 7

$\therefore$ fraction $= \frac{7}{28} = \frac{1}{4}$

10. $\frac{3}{7}$ of a collection of

(i) 63 balls

$\Rightarrow \frac{3}{7} \times 63 = 3 \times 9 = 27$ balls

(ii) 49 biscuits

$\Rightarrow \frac{3}{7} \times 49 = 3 \times 7 = 21$ biscuits

Exercise 5.2

1. (i) $\frac{46}{7}$

$$\begin{array}{r|l} 7 & 46 \\ \hline & 42 \\ \hline & 4 \end{array}$$

Mixed fraction $= 6\frac{4}{7}$

(ii) $\frac{26}{3}$

$$\begin{array}{r|l} 3 & 26 \\ \hline & 24 \\ \hline & 2 \end{array}$$

Mixed fraction $= 8\frac{2}{3}$

(iii) $\frac{17}{4}$

$$\begin{array}{r|l} 4 & 17 \\ \hline & 16 \\ \hline & 1 \end{array}$$

Mixed fraction $= 4\frac{1}{4}$

2. (i) $7\frac{3}{20}$

Improper fraction $= \frac{20 \times 7 + 3}{20} = \frac{143}{20}$

(ii) $12\frac{1}{8}$

Improper fraction $= \frac{8 \times 12 + 1}{8} = \frac{97}{8}$

(ii) $10\frac{4}{5}$

Improper fraction $= \frac{5 \times 10 + 4}{5} = \frac{54}{5}$

3. (i) $\frac{1}{5}, \frac{4}{10}$

First find the LCM of 5 and 10

$\therefore$ LCM of 5 and $10 = 2 \times 5$

$= 10$

Now, $\frac{1}{5} = \frac{1 \times 2}{5 \times 2} = \frac{2}{10}$

and $\frac{4}{10} = \frac{4 \times 1}{10 \times 1} = \frac{4}{10}$

So, $\frac{2}{10}$ and $\frac{4}{10}$ are like fractions.

2	5, 10
5	5, 5
	1, 1

(ii) $\frac{13}{6}, \frac{4}{24}, \frac{13}{18}$

First find the LCM of 6, 24 and 18

$\therefore$ LCM of 6, 24 and 18

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

$= 72$

Now, $\frac{13}{6} = \frac{13 \times 12}{6 \times 12} = \frac{156}{72}$

$\frac{4}{24} = \frac{4 \times 3}{24 \times 3} = \frac{12}{72}$

and $\frac{13}{18} = \frac{13 \times 4}{18 \times 4} = \frac{52}{72}$

So, $\frac{156}{72}, \frac{12}{72}$ and $\frac{52}{72}$ are like fractions.

2	6, 24, 18
2	3, 12, 9
2	3, 6, 9
3	3, 3, 9
3	1, 1, 3
	1, 1, 1

4. Unit fractions are $\frac{1}{5}$ and $\frac{1}{12}$

Like fractions are $\frac{2}{5}, \frac{1}{5}$ and $\frac{11}{5}$

Unlike fractions are $\frac{3}{4}, \frac{7}{2}, \frac{8}{9}$

5. Proper fractions are $\frac{5}{8}, \frac{12}{15}$ and $\frac{6}{10}$

Improper fractions are $\frac{18}{7}$ and $\frac{13}{5}$

Exercise 5.3

1. (i) $\frac{6}{10}$

Three equivalent fractions of $\frac{6}{10}$.

$\frac{6 \times 2}{10 \times 2} = \frac{12}{20}, \frac{6 \times 3}{10 \times 3} = \frac{18}{30}$ and $\frac{6 \times 4}{10 \times 4} = \frac{24}{40}$

So, $\frac{12}{20}, \frac{18}{30}$ and $\frac{24}{40}$ are three equivalent fractions of $\frac{6}{10}$.

(ii) $\frac{7}{8}$

Three equivalent fractions of $\frac{7}{8}$

$\frac{7 \times 2}{8 \times 2} = \frac{14}{16}, \frac{7 \times 3}{8 \times 3} = \frac{21}{24}$ and $\frac{7 \times 4}{8 \times 4} = \frac{28}{32}$

So, $\frac{14}{16}, \frac{21}{24}$ and $\frac{28}{32}$ are three equivalent fractions of $\frac{7}{8}$.

(iii) $\frac{7}{5}$

Three equivalent fractions of $\frac{7}{5}$

$\frac{7 \times 2}{5 \times 2} = \frac{14}{10}, \frac{7 \times 3}{5 \times 3} = \frac{21}{15}$ and $\frac{7 \times 4}{5 \times 4} = \frac{28}{20}$

So, $\frac{14}{10}, \frac{21}{15}$ and $\frac{28}{20}$ are three equivalent fractions of $\frac{7}{5}$.

(iv) $\frac{3}{8}$

Three equivalent fractions of $\frac{3}{8}$.

$$\frac{3\times 2}{8\times 2}=\frac{6}{16}, \frac{3\times 3}{8\times 3}=\frac{9}{24} \text{ and } \frac{3\times 4}{8\times 4}=\frac{12}{32}$$

So, $\frac{6}{16}, \frac{9}{24}$ and $\frac{12}{32}$ are three equivalent fractions of $\frac{3}{8}$.

2. (i) $\frac{13}{14}$ and $\frac{3}{7}$

We have, $\frac{13}{14} \times \frac{3}{7}$ (by cross multiply)

$13\times 7 \quad 14\times 3$

$91 \neq 42$

So, $\frac{13}{14}$ and $\frac{3}{7}$ are not equivalent fractions.

(ii) $\frac{3}{9}$ and $\frac{5}{15}$

We have, $\frac{3}{9} \times \frac{5}{15}$ (by cross multiply)

$3\times 15 \quad 9\times 5$

$45 = 45$

So, $\frac{3}{9}$ and $\frac{5}{15}$ are equivalent fractions.

(iii) $\frac{3}{5}$ and $\frac{12}{20}$

We have, $\frac{3}{5} \times \frac{12}{20}$ (by cross multiply)

$3\times 20 \quad 5\times 12$

$60 = 60$

So, $\frac{3}{5}$ and $\frac{12}{20}$ are equivalent fractions.

3. Equivalent fractions of $\frac{3}{5}$ having

(i) denominator = 20

Here, we know that to find an equivalent fraction we have to multiply the numerator and denominator by a same number.

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

Hence, $\frac{12}{20}$ is the required fraction.

(ii) numerator 27

Here, we know that to find an equivalent fraction we have to multiply the numerator and denominator by a same number.

So, $\frac{3\times 9}{5\times 9}=\frac{\boxed{27}}{45}$

Hence, $\frac{27}{45}$ is the required fraction.

(iii) denominator 30

Here, we know that to find an equivalent fraction we have to multiply the numerator and denominator by a same number.

So, $\frac{3\times 6}{5\times 6}=\frac{\boxed{18}}{30}$

Hence, $\frac{18}{30}$ is the required fraction.

4. Equivalent fraction of $\frac{36}{48}$ with

(i) Numerator 9

Here, we know that to find an equivalent fraction we have to divide the numerator and denominator by a same number.

So, $\frac{36\div 4}{48\div 4}=\frac{\boxed{9}}{12}$

Hence, $\frac{9}{12}$ is the required fraction.

(ii) Denominator 4

Here, we know that to find an equivalent fraction we have to divide the numerator and denominator by a same number.

So, $\frac{36\div 12}{48\div 12}=\frac{\boxed{3}}{4}$

Hence, $\frac{3}{4}$ is the reuired fraction.

5. Fill in the blanks :

(i) $\frac{1}{4}=\frac{\quad}{36}$

here, $\frac{1\times 9}{4\times 9}=\frac{9}{36}$

(ii) $\frac{5}{7}=\frac{25}{\quad}$

here, $\frac{5\times 5}{7\times 5}=\frac{25}{35}$

(iii) $\frac{12}{8}=\frac{\boxed{96}}{64}$

here, $\frac{12\times 8}{8\times 8}=\frac{\boxed{96}}{64}$

(iv) $\frac{\quad}{20}=\frac{9}{60}$

here, $\frac{9}{60}=\frac{\quad}{20}$

$\frac{9\div 3}{60\div 3}=\frac{3}{20}$

6. (i) $\frac{68}{17}$

Prime factors of $68 = 2 \times 2 \times 17$

Prime factors of $17 = 1 \times 17$

$\therefore$ HCF of 17 and 68 = 17

So, $\frac{68 \div 17}{17 \div 17} = \frac{4}{1} = 4$

(ii) $\frac{84}{98}$

Prime factors of $84 = 2 \times 2 \times 3 \times 7$

Prime factors of $98 = 2 \times 7 \times 7$

$\therefore$ HCF of 84 and $98 = 2 \times 7 = 14$

So, $\frac{84 \div 14}{98 \div 14} = \frac{6}{7}$

(iii) $\frac{40}{38}$

Prime factors of $40 = 2 \times 2 \times 2 \times 5$

Prime factors of $38 = 2 \times 19$

$\therefore$ HCF of 40 and 38 = 2

So, $\frac{40 \div 2}{38 \div 2} = \frac{20}{19}$

(iv) $\frac{105}{45}$

Prime factors of $105 = 3 \times 5 \times 7$

Prime factors of $45 = 3 \times 3 \times 5$

$\therefore$ HCF of 105 and $35 = 3 \times 5 = 15$

So, $\frac{105 \div 15}{45 \div 15} = \frac{7}{3}$

(v) $\frac{65}{117}$

Prime factors of $65 = 5 \times 13$

Prime factors of $117 = 3 \times 3 \times 13$

$\therefore$ HCF of 65 and 117 = 13

So, $\frac{65 \div 13}{117 \div 13} = \frac{5}{9}$

7. Arrange in ascending order :

(i) $\frac{3}{8}, \frac{5}{6}, \frac{2}{14}, \frac{6}{8}$

First we convert the given unlike fractions into like fractions and then compare.

2	8, 6, 14, 8
2	4, 3, 7, 4
2	2, 3, 7, 2
3	1, 3, 7, 1
7	1, 1, 7, 1
	1, 1, 1, 1

LCM of 8, 6, 14 and 8

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

$= 168$

Now,

$$\frac{3}{8} = \frac{3 \times 21}{8 \times 21} = \frac{63}{168}$$

$$\frac{5}{6} = \frac{5 \times 28}{6 \times 28} = \frac{140}{168}$$

$$\frac{2}{14} = \frac{2 \times 12}{14 \times 12} = \frac{24}{168}$$

and $$\frac{6}{8} = \frac{6 \times 21}{8 \times 21} = \frac{126}{168}$$

On comparing, we get

$$\frac{24}{168} < \frac{63}{168} < \frac{126}{168} < \frac{140}{168}$$

$$\Rightarrow \quad \frac{2}{14} < \frac{3}{8} < \frac{6}{8} < \frac{5}{6}$$

(ii) $\frac{3}{2}, \frac{1}{5}, \frac{7}{4}, \frac{5}{8}$

First we convert the given unlike fractions into like fractions and then compare.

2	2, 5, 4, 8
2	1, 5, 2, 4
2	1, 5, 1, 2
5	1, 5, 1, 1
	1, 1, 1, 1

LCM of $2, 5, 4$ and

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

$$= 40$$

Now,

$$\frac{3}{2} = \frac{3 \times 20}{2 \times 20} = \frac{60}{40}$$

$$\frac{1}{5} = \frac{1 \times 8}{5 \times 8} = \frac{8}{40}$$

$$\frac{7}{4} = \frac{7 \times 10}{4 \times 10} = \frac{70}{40}$$

and $$\frac{5}{8} = \frac{5 \times 5}{8 \times 5} = \frac{25}{40}$$

Un comparing, we get

$$\frac{8}{40} < \frac{25}{40} < \frac{60}{40} < \frac{70}{40}$$

$$\Rightarrow \quad \frac{1}{5} < \frac{5}{8} < \frac{3}{2} < \frac{7}{4}$$

8. Arrange in descending order :

(i) $\frac{2}{7}, \frac{2}{5}, \frac{3}{7}, \frac{6}{10}$

First we convert the given unlike fractions into like fractions and then compare.

2	7, 5, 7, 10
5	7, 5, 7, 5
7	7, 1, 7, 1
	1, 1, 1, 1

LCM of $7, 5, 7$ and 10

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

$$= 70$$

Now,

$$\frac{2}{7} = \frac{2\times10}{7\times10} = \frac{20}{70}$$

$$\frac{2}{5} = \frac{2\times14}{5\times14} = \frac{28}{70}$$

$$\frac{3}{7} = \frac{3\times10}{7\times10} = \frac{30}{70}$$

and $$\frac{6}{10} = \frac{6\times7}{10\times7} = \frac{42}{70}$$

On comparing, we get

$$\frac{42}{70} > \frac{30}{70} > \frac{28}{70} > \frac{20}{70}$$

$$\Rightarrow \quad \frac{6}{10} > \frac{3}{7} > \frac{2}{5} > \frac{2}{7}$$

(ii) $\frac{8}{12}, \frac{4}{13}, \frac{11}{13}, \frac{7}{13}$

Here, all fractions are already in like fractions, so we compare the numerators only in descending order, we get

$$\frac{11}{13} > \frac{8}{13} > \frac{7}{13} > \frac{4}{13}.$$

9. (i) $\frac{5}{7} > \frac{8}{7}$

here, $5 < 8$

(ii) $\frac{1}{9} < \frac{1}{4}$

here, $1\times4 \;\; 9\times1$

$4 < 9$

(iii) $\frac{9}{5} > \frac{7}{9}$

here, $9\times9 \quad 5\times7$

$81 > 35$

(iv) $\frac{12}{9} = \frac{16}{2}$

here, $12\times12 \;\; 16\times9$

$144 = 144$

10. No. of pages read by Little = 50 pages

No. of pages read by Nitesh = $\frac{1}{5} \times 200$ pages

= 40 pages

So, 50 pages > 40 pages

Hence, Nitesh read less pages.

11. Alka exercised for = $\frac{5}{6}$ of an hour

$= \frac{5}{6} \times 60$ minutes

= 50 minutes

Priya exercised for = $\frac{1}{2}$ an hour = $\frac{1}{2} \times 60$ minutes

= 30 minutes

So, 50 minutes > 30 minutes

Hence, Alka exercised for a longer time.

Exercise 5.4

1. (i) $\frac{1}{3} + \frac{2}{3}$

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

$= 1$

(ii) $\frac{12}{7} - \frac{3}{7}$

$= \frac{12-3}{7}$

$= \frac{9}{7}$

(iii) $\frac{4}{9} + \frac{4}{9}$

$= \frac{4+4}{9} = \frac{8}{9}$

(iv) $\frac{8}{11} - \frac{3}{11}$

$= \frac{8-3}{11} = \frac{5}{11}$

2. (i) $\frac{3}{8} + \frac{4}{9}$

$= \frac{27+32}{72} = \frac{59}{72}$ (LCM of 8 and 9 = 72)

(ii) $1\frac{1}{2} + 3\frac{3}{4}$

$= \frac{3}{2} + \frac{15}{4}$

$= \frac{2\times 3 + 1\times 15}{4}$ (LCM of 2 and 4 = 4)

$= \frac{6+15}{4} = \frac{21}{4} = 5\frac{1}{4}$

(iii) $\frac{11}{15} + \frac{7}{9} + \frac{8}{10}$

$= \frac{6\times 11 + 10\times 7 + 9\times 8}{90}$ (∵ LCM of 15, 9 and 10 = 90)

$= \frac{66+70+72}{90}$

$= \frac{208}{90} = \frac{104}{45} = 2\frac{14}{45}$

(iv) $4\frac{1}{3} + 3\frac{1}{9} - 6\frac{1}{6}$

$= \frac{13}{3} + \frac{28}{9} - \frac{37}{6}$

$= \frac{6\times 13 + 2\times 28 - 3\times 37}{18}$ (∵ LCM of 3, 9 and 6 = 18)

$= \frac{78+56-111}{18}$

$$= \frac{134 - 111}{18}$$

$$= \frac{23}{18} = 1\frac{5}{18}$$

(v) $8\frac{4}{5} - 2\frac{1}{15}$

$$= \frac{44}{5} - \frac{31}{15}$$

$$= \frac{3 \times 44 - 1 \times 31}{15} \qquad (\because \text{ LCM of 5 and 15} = 15)$$

$$= \frac{132 - 31}{15} = \frac{101}{15} = 6\frac{11}{15}$$

(vi) $\frac{1}{6} + \frac{5}{10} - \frac{1}{3}$

$$= \frac{5 \times 1 + 3 \times 5 - 10 \times 1}{30} \quad (\because \text{LCM of 6, 10 and 3} = 30)$$

$$= \frac{5 + 15 - 10}{30}$$

$$= \frac{20 - 10}{30} = \frac{10}{30} = \frac{1}{3}$$

3. (i) Sum of $4\frac{3}{10}$ and $1\frac{1}{5} = 4\frac{3}{10} + 1\frac{1}{5}$

$$= \frac{43}{10} + \frac{6}{5}$$

$$= \frac{43 + 12}{10} = \frac{55}{10}$$

$$= \frac{11}{2}$$

Now, subtract $\frac{11}{2}$ from 19

$$= \frac{19}{1} - \frac{11}{2}$$

$$= \frac{38 - 11}{2} = \frac{27}{2} = 13\frac{1}{2}$$

(ii) Difference of $\frac{3}{4}$ and $\frac{1}{8} = \frac{3}{4} - \frac{1}{8}$

$$= \frac{6 - 1}{8} = \frac{5}{8}$$

Now, subtract $\frac{5}{8}$ from $3\frac{1}{2}$

$$= 3\frac{1}{2} - \frac{5}{8} = \frac{7}{2} - \frac{5}{8}$$

$$= \frac{28-5}{8} = \frac{23}{8} = 2\frac{7}{8}$$

4. Time spent on studies $= 1\frac{1}{2}$ hours $= \frac{3}{2}$ hours

Time spent on watching TV $= \frac{1}{2}$ an hour

$\therefore$ Total time spent on studies and watching TV

$$= \left(\frac{3}{2} + \frac{1}{2}\right) \text{hours}$$

$$= \frac{3+1}{2} = \frac{4}{2} = \frac{2}{1} \text{ hours}$$

Hence, Saurabh spent 2 hours on studies and watching TV.

5. Quantity of milk $= 10\frac{1}{2}$ litres $= \frac{21}{2}$ litres

Quantity of water added to milk $= 1\frac{1}{7}$ litres $= \frac{8}{7}$ litres

$\therefore$ Total amount of milk $= \left(\frac{21}{2} + \frac{8}{7}\right)$ litres

$$= \frac{147+16}{14} = \frac{163}{14} = 11\frac{9}{14} \text{ litres}$$

Hence, the total amount of milk made by the milkman is $11\frac{9}{14}$ litres.

6. Length of the ribbon $= 5\frac{1}{2}$ metres

Length of the ribbon cut $= 3\frac{2}{3}$ metres

$\therefore$ Length of the ribbon left $= \left(5\frac{1}{2} - 3\frac{2}{3}\right)$ metres

$$= \frac{11}{2} - \frac{11}{3}$$

$$= \frac{33-22}{6}$$

$$= \frac{11}{6} = 1\frac{5}{6}$$

Hence, the length of the ribbon left is $1\frac{5}{6}$ metres.

7. Distance between Kavita's collage and house $= 5\frac{2}{3}$ km $= \frac{17}{3}$ km

Distance covered by metro train $= 4\frac{1}{2}$ km $= \frac{9}{2}$ km

$\therefore$ Distance covered by rickshaw $= \left(\frac{17}{3} - \frac{9}{2}\right)$ km

$= \frac{34 - 27}{6}$ km $= \frac{7}{6}$ km

$= 1\frac{1}{6}$ km.

Hence, Kavita covers $1\frac{1}{6}$ km by rickshaw.

8. Weight of Potatoes $= 3\frac{1}{2}$ kg $= \frac{7}{2}$ kg

Weight of Onions $= 2\frac{1}{4}$ kg $= \frac{9}{4}$ kg

Weight of Tomatoes $= 1\frac{1}{2}$ kg $= \frac{3}{2}$ kg

$\therefore$ Total weight of vegetables $= \left(\frac{7}{2} + \frac{9}{4} + \frac{3}{2}\right)$ kg

$= \frac{14 + 9 + 6}{4}$

$= \frac{29}{4} = 7\frac{1}{4}$ kg.

Hence, the total weight of vegetables purchased by Manju is $7\frac{1}{4}$ kg.

9. Total weight of flour 20 kg

Flour used on Monday $= 6\frac{3}{4}$ kg $= \frac{27}{4}$ kg.

Flour used on Tuesday $= 12\frac{1}{2}$ kg $= \frac{25}{2}$ kg

$\therefore$ Total flour used by Yogesh $= \left(\frac{27}{4} + \frac{25}{2}\right)$ kg.

$= \frac{27 + 50}{4} = \frac{77}{4}$

Weight of left flour $= \left(20 - \frac{77}{4}\right)$ kg.

$= \frac{80 - 77}{4} = \frac{3}{4}$ kg.

Hence, $\frac{3}{4}$ kg flour is left with Yogesh.

10. Weight of sugar bought by Deepak = $2\frac{1}{2}$ kg = $\frac{5}{2}$ kg

Weight of rice bought by Deepak = $5\frac{1}{4} = \frac{21}{4}$ kg

$\therefore$ Total weight = $\left(\frac{5}{2} + \frac{21}{4}\right)$ kg.

$= \frac{10 + 21}{4} = \frac{31}{4}$ $7\frac{3}{4}$ kg.

Hence, Deepak carried $7\frac{3}{4}$ kg of weight.

Chapter 6 : DECIMAL

Exercise 6.1

1. (i) $\underline{9}831.5$ Place value of 9 is thousands = 9000

(ii) $65\underline{3}.46$ Place value of 3 is ones = 3

(iii) $24.3\underline{2}5$ Place value of 2 is hundredths = $\frac{2}{100}$

(iv) $625.00\underline{4}$ Place value of 4 is thousandths = $\frac{4}{1000}$

(v) $38.\underline{1}3$ Place value of 1 is tenths = $\frac{1}{10}$

2. (i) 2 ones and 1 hundredth

$= 2 \times 1 + 1 \times \frac{1}{100} = 2 + \frac{1}{100}$

$= 2 + 0.01 = 2.01$

(ii) 5 hundreds 2 ones and 5 hundredths

$= 5 \times 100 + 2 \times 1 + 5 \times \frac{1}{100}$

$= 500 + 2 + 0.05$

$= 502.05$

(iii) 5 tens 3 ones and 2 tenths

$= 5 \times 10 + 3 \times 1 + 2 \times \frac{1}{10}$

$= 50 + 3 + 0.2$

$= 53.2$

(iv) 4 thousands 3 hundreds and 2 tenths

$= 4 \times 1000 + 3 \times 100 + 2 \times \frac{1}{10}$

$= 4000 + 300 + 0.02$

$= 4300.2$

3. (i) 50.90

$= 5 \times 10 + 0 \times 1 + 9 \times \frac{1}{10} + 0 \times \frac{1}{100}$

(ii) 425.32

$$= 4 \times 100 + 2 \times 10 + 5 \times 1 + 3 \times \frac{1}{10} + 2 \times \frac{1}{100}$$

(iii) 305.69

$$= 3 \times 100 + 0 \times 10 + 5 \times 1 + 6 \times \frac{1}{10} + 9 \times \frac{1}{100}$$

(iv) 63.012

$$= 6 \times 10 + 3 \times 1 + 0 \times \frac{1}{10} + 1 \times \frac{1}{100} + 2 \times \frac{1}{1000}$$

4. (i) $50 + 6 + \frac{3}{10} + \frac{7}{100}$

$= 56.37$

(ii) $500 + 50 + \frac{0}{10} + \frac{5}{100} + \frac{5}{1000}$

$= 550.055$

(iii) $700 + 30 + 2 + \frac{3}{10} + \frac{3}{100} + \frac{9}{1000}$

$= 732.339$

(iv) $213 + \frac{2}{10} + \frac{0}{100} + \frac{7}{1000}$

$= 213.207$

5. (i) 15.3

Tens	Ones	•	Tenths
1	5		3

(ii) 5.07

Ones	•	Tenths	Hundredths
5		0	7

(iii) 600.032

Hundreds	Tens	Ones	•	Tenths	Hundredths	Thousandths
6	0	0		0	3	2

(iv) 0.13

Ones	•	Tenths	Hundredths
0		1	3

6. (i) 0.60

$= \frac{60}{100}$

$= \frac{6}{10} = \frac{3}{5}$

(ii) 0.27

$= \frac{27}{100}$

(ii) 0.75

$= \frac{75}{100}$

$= \frac{3}{4}$

(iv) 0.130

$= \frac{130}{1000} = \frac{13}{100}$

7. (i) 8.9, 89.36, 123.4

$= 8.90, 89.36, 123.40$

(ii) 0.6, 1.29, 11. 234, 9.34

$= 0.600, 1.290, 11.234, 9.340$

8. (i) $\frac{5}{10}$

10) 50 (.5
50
×

$= 0.5$

(ii) $\frac{13}{25}$

25)130(.52
125
50
50
×

$= 0.52$

(iii) $\frac{12}{5} = 2.4$

5) 12 (2.4
10
20
20
×

(iv) $12\frac{1}{4} = \frac{49}{4}$

4) 49 (12.25
4
9
8
10
8
20
20
×

$= 12.25$

Exercise 6.2

1. (i) 4.13 ☐ 4.02

Here, ones place in both decimals is 4.

So, by comparing decimal parts,

$0.13 > 0.02$

$\therefore$ $4.13 \boxed{>} 4.02$

(ii) 2.034 ☐ 2.036

By comparing the decimal parts,

$0.034 < 0.036$

$\therefore$ $2.034 < 2.036$

(iii) 3.40 3.4

By making like decimals, we have

$\therefore$ $3.40 = 3.40$

(iv) 0.008 0.01

By comparing decimal parts,

$0.008 < 0.01$

$0.008 \boxed{<} 0.01$

(v) 24.36 ☐ 20.72

By comparing the whole parts,

$24 > 20$

$\therefore$ $24.36 \boxed{>} 20.72$

(vi) 5.85 ☐ 5.058

By comparing the decimal part

$0.850 > 0.058$

$\therefore$ $5.85 \boxed{>} 5.058$

2. (i) 0.6 or 0.3

Clearly, in the decimal part $\frac{6}{10}$ is greater than $\frac{3}{10}$.

So, $0.6 > 0.3$

(ii) 5.40 or 5.406

Clearly, in the decimal part $\frac{406}{1000}$ is greater than $\frac{40}{100}$.

So, $5.40 < 5.406$

(iii) 140.65 or 37.99
Clearly, in the whole part 140 is greater than 37.
So, $140.65 > 37.99$

(iv) 50.08 or 50.3
Clearly in the decimal part $\frac{3}{10}$ is greater than $\frac{8}{100}$.
So, $50.08 < 50.3$

3. Ascending order

(i) 0.88, 0.8, 0.808, 0.08
$= 0.08 < 0.8 < 0.808 < 0.88$

(ii) 5.65, 6.56, 5.05, 5.66
$= 5.05 < 5.65 < 5.66 < 6.56$

4. Descnding order

(i) 8.942, 8.6, 8.81, 8.09
$= 8.942 > 8.81 > 8.6 > 8.09$

(ii) 7.03, 7.15, 7.35, 7.05
$= 7.35 > 7.15 > 7.05 > 7.03$

5. Time taken by Swati = 68.1 seconds
Time taken by Rashmi = 68.02 seconds
Here, $68.1 > 68.02$
So, Swati is faster.

Exercise 6.3

1. (i) 65 mm

$1 \text{ mm} = \frac{1}{10} \text{ cm}$

$65 \text{ mm} = \frac{65}{10} \text{ cm} = 6.5 \text{ cm}$

(ii) 5 mm

$1 \text{ mm} = \frac{1}{10} \text{ cm}$

$5 \text{ mm} = \frac{5}{10} \text{ cm} = 0.5 \text{ cm}$

(iii) 50 cm 23 mm

$1 \text{ mm} = \frac{1}{10} \text{ cm}$

$23 \text{ mm} = \frac{23}{10} \text{ cm} = 2.3 \text{ cm}$

$\therefore$ 50 cm 23 mm
$= (50 + 2.3) \text{ cm} = 52.3 \text{ cm}$

(iv) 125 mm

$1 \text{ mm} = \frac{1}{10} \text{ cm}$

$125 \text{ mm} = \frac{125}{10} \text{ cm} = 12.5 \text{ cm}$

2. (i) 450 cm

$1 \text{ cm} = \frac{1}{100} \text{ m}$

$450 \text{ cm} = \frac{450}{100} \text{ m} = 4.5 \text{ m}$

(ii) 25 cm

$1 \text{ cm} = \frac{1}{100} \text{ m}$

$25 \text{ cm} = \frac{25}{100} \text{ m} = 0.25 \text{ m}$

(iii) 3 m 30 cm

$1 \text{ cm} = \frac{1}{100} \text{ m}$

$1 \text{ cm} = \frac{30}{100} \text{ m} = 0.30 \text{ m}$

3 m 30 cm
$= (3 + 0.30) \text{ m} = 3.30 \text{ m}$

(iv) 5 cm

$1 \text{ cm} = \frac{1}{100} \text{ m}$

$5 \text{ cm} = \frac{5}{100} \text{ m} = 0.05 \text{ m}$

3. (i) 25 g

$$1\text{ g} = \frac{1}{1000}\text{ kg.}$$

$$25\text{ g} = \frac{25}{1000}\text{ kg} = 0.025\text{ kg}$$

(ii) $$3\text{ g} = \frac{3}{1000}\text{ kg} = 0.003\text{ kg}$$

(iii) 6004 g

$$1\text{ g} = \frac{1}{1000}\text{ kg}$$

$$6004\text{ g} = \frac{6004}{1000}\text{ kg} = 6.004\text{ kg}$$

(iv) 5 kg 75 g

$$1\text{ g} = \frac{1}{1000}\text{ kg}$$

$$75\text{ g} = \frac{75}{1000}\text{ kg} = 0.075\text{ kg}$$

$\therefore$ 5 kg 75 g

$= (5 + 0.075)\text{ kg} = 5.075\text{ kg}$

4. (i) 345 m

$$1\text{ m} = \frac{1}{1000}\text{ km}$$

$$345\text{ m} = \frac{345}{1000}\text{ km} = 0.345\text{ km}$$

(ii) 50 km 345 m

$$1\text{ m} = \frac{1}{1000}\text{ km}$$

$$345\text{ m} = \frac{345}{1000}\text{ km} = 0.345\text{ km}$$

$\therefore$ 50 km 345 m $= (50 + 0.345)$ km

$= 50.345$ km

(iii) 6 m

$$1\text{ m} = \frac{1}{1000}\text{ km}$$

$$6\text{ m} = \frac{6}{1000}\text{ km} = 0.006\text{ km}$$

(iv) 3446 m

$$1\text{ m} = \frac{1}{1000}\text{ km}$$

$$3446\text{ m} = \frac{3446}{1000}\text{ km} = 3.446\text{ km}$$

5. (i) 320 paise

$$1\text{ paisa} = \frac{1}{100}\text{ rupee}$$

$$320\text{ paise} = \frac{320}{100}\text{ rupee} = 3.20\text{ rupee}$$

(ii) 5 paise

$$1\text{ paisa} = \frac{1}{100}\text{ rupee}$$

$$5\text{ paise} = \frac{5}{100}\text{ rupee} = 0.05\text{ rupee.}$$

(iii) 1530 paise

$$1\text{ paisa} = \frac{1}{100}\text{ rupee}$$

$$1530\text{ paise} = \frac{1530}{100}\text{ rupee}$$

$= 15.30$ rupees

(iv) 20 rupees 75 paise

$$1\text{ paisa} = \frac{1}{100}\text{ rupee}$$

$$75\text{ paise} = \frac{75}{100}\text{ rupee} = 0.75\text{ rupee}$$

$\therefore$ 20 rupees 75 paise

$= (20 + 0.75)$ rupees

$= 20.75$ rupees.

6. Rahul has money = 5000 paise

His money in rupees is

$$1\text{ paisa} = \frac{1}{100}\text{ rupees}$$

$$5000\text{ paise} = \frac{5000}{100}\text{ rupee}$$

$= 50$ rupees

7. Length of mobile = 11 cm 4 mm

$$= 11\text{ cm} + \frac{4}{10}\text{ cm}$$

$$= (11 + 0.4)\text{ cm}$$

$$= 11.4\text{ cm}$$

Hence, length of mobile in cm is 11.4.

8. $1\text{ mm} = \frac{1}{10}\text{ cm}$

$$125\text{ mm} = \frac{125}{10}\text{ cm} = 12.5\text{ cm}$$

$$1\text{ mm} = \frac{1}{1000}\text{ m}$$

$$125\text{ mm} = \frac{125}{1000}\text{ m} = 0.125\text{ m}$$

and $$1\text{ mm} = \frac{1}{1000000}\text{ km}$$

$$125\text{ mm} = \frac{125}{1000000}\text{ km}$$

$$= 0.000125\text{ km}$$

Exercise 6.4

1. (i) 5.857, 6.42 and 0.6

Sum

$$\begin{array}{r} 5.857 \\ 6.420 \\ +\ 0.600 \\ \hline 12.877 \end{array}$$

(ii) 0.29, 1.6 and 55

Sum

$$\begin{array}{r} 0.29 \\ 1.60 \\ +\ 55.00 \\ \hline 56.89 \end{array}$$

(iii) 16 + 0.732 + 16.8

Sum

$$\begin{array}{r} 16.000 \\ 0.732 \\ +\ 16.800 \\ \hline 33.532 \end{array}$$

(iv) 180.32 + 26.2 + 0.38

Sum

$$\begin{array}{r} 180.32 \\ 26.20 \\ +\ 0.38 \\ \hline 206.90 \end{array}$$

2. (i) Subtract 9.325 from 12

$$\begin{array}{r} 12.000 \\ -\ 9.325 \\ \hline 2.675 \end{array}$$

(ii) Subtract 2.36 from 4.4

$$\begin{array}{r} 4.40 \\ -\ 2.36 \\ \hline 2.04 \end{array}$$

(iii) Subtract 0.135 from 0.36

$$\begin{array}{r} 0.360 \\ -\ 0.135 \\ \hline 0.225 \end{array}$$

(iv) Subtract 24.65 from 82.5

$$\begin{array}{r} 82.50 \\ -\ 24.65 \\ \hline 57.85 \end{array}$$

3. (i) 66.30 – 7.33 + 6.666

$$\begin{array}{r} 66.30 \\ -\ 7.33 \\ \hline 58.97 \end{array} \qquad \begin{array}{r} 58.970 \\ +\ 6.666 \\ \hline 65.636 \end{array}$$ **Ans.**

(ii) 300 + 100.23 – 28.62

$$\begin{array}{r} 300.00 \\ +\ 100.23 \\ \hline 400.23 \end{array} \qquad \begin{array}{r} 400.23 \\ -\ 28.62 \\ \hline 371.61 \end{array}$$ **Ans.**

(iii) 185. 30 – 105.605 + 156.49

$$\begin{array}{r} 185.300 \\ -\ 105.605 \\ \hline 79,695 \end{array} \qquad \begin{array}{r} 79.695 \\ +\ 156.490 \\ \hline 236.185 \end{array}$$ **Ans.**

(iv) 25.5 + 34.68 – 12.73

$$\begin{array}{r} 25.50 \\ +\ 34.68 \\ \hline 60.18 \end{array} \qquad \begin{array}{r} 60.18 \\ -\ 12.73 \\ \hline 47.45 \end{array}$$ **Ans.**

4. Cost of shoes = ₹ 636.50

Cost of socks = ₹ 49.90

Cost of shirt = ₹ 955.550

$$\begin{array}{rr} & 636.500 \\ + & 49.900 \\ & 955.550 \\ \hline \text{Total money} = & 1641.950 \end{array}$$

Hence, Raja spent the total money ₹ 1641.950

5. Weight of wheat sold on first day = 35.750 kg

Weight of wheat sold on second day = 43.150 kg.

Weight of wheat sold on third day = 50.500 kg.

$$\begin{array}{rr} & 35.750 \\ & 43.150 \\ + & 50.500 \\ \hline \text{Total weight} = & 129.400 \end{array}$$

Hence, total wright of wheat sold by the shopkeeper is 129.400 kg

6. Ram needs the cloth = 23.25 m

He could get only = 15.075 m

required cloth =

$$\begin{array}{r} 23.250 \\ -15.075 \\ \hline 08.175 \end{array}$$

Hence, Ram still needs 8.175 m cloth to buy

7. Total weight of fruits = 75.255 kg
Weight of rotten fruits = 35.023 kg
Weight of fresh fruits left

$$\begin{array}{r} 75.255 \\ -\ 35.023 \\ \hline 40.232 \end{array}$$

Hence, 40.232 kg fruits are still fresh.

8. Travels by bus = 16 km 370 m
Travels by car = 8 km 9 m
Travels on foot = 600 m

$$\begin{array}{rr} & 16.370 \\ & 8.009 \\ +\ & 0.600 \\ \hline \text{Total distance} = & 24.979 \end{array}$$

Hence, Shashi's school is 24.979 km far from her residence.

9. Total weight of vegetable = 15 kg
Total weight of onions = 5 kg 50 kg
Total weight of tomatoes = 4 kg 75 g

$$\begin{array}{r} 5.050 \\ +\ 4.075 \\ \hline 9.125 \end{array}$$

$\therefore$ Weight of onions and tomatoes = 9.125

$$\begin{array}{r} 15.000 \\ -\ 9.125 \\ \hline 5.875 \end{array}$$

So, weight of potatoes = 5.875

Hence, Sita bought 5.875 kg (5 kg 875 g) potatoes.

10. (a)

$$\begin{array}{r} 150.00 \\ -\ 65.30 \\ \hline 84.70 \end{array}$$

The required number is be = 84.70

(b) Sum

$$\begin{array}{r} 12.500 \\ +\ 24.642 \\ \hline 37.142 \end{array}$$

Now, subtract 37.142 from 82.63

$$\begin{array}{r} 82.630 \\ -\ 37.142 \\ \hline 45.488 \end{array}$$

Chapter 7 : INTRODUCTION TO ALGEBRA

Exercise 7.1

1. Marks in Mathematics = 100

Marks in Science = x

$\therefore$ Total marks scored by Neelu = $100 + x$

2. Let the number be x. Then according to question.

$= \{(x \times 7) + 5\} - 35$

$= (7x + 5) - 35$

3. Cost of a note book = ₹ n

No. of note books bought by Muskan = 5

No. of note books bought by Dhruv = 7

No. of note books bought by Kanak = 4

Total no. of note books = $5 + 7 + 4 = 16$

$\therefore$ Total price = ₹ $n \times$ Number of hole books

= ₹ $n \times 16$

= ₹ $16n$

4. (i)

1	2	3	4	x
4	7	10	$4 \times 3 + 1 = 13$	$3x + 1$

(ii)

1	2	3	4	5	n
6	10	14	$4 \times 4 + 2 = 18$	$4 \times 5 + 2 = 22$	$4n + 2$

5.

No. of Trapeziums	1	2	3	4	5	x
No. of matchsticks	5	9	13	17	21	$4x + 1$

7.

No. of squares	1	2	3	4	5	8	n
No. of dots	4	7	10	13	16	25	$3n + 1$
No. of Matchsticks	4	8	12	16	20	32	$4n$

Exercise 7.2

1. (i) $(4 \times 2) - 8x$ — Yes, it is an algebraic expression having variable x.

(ii) $10x + 3$ — Yes, it is an algebraic expression having variable x.

(iii) $3 + 4(2 - 1)$ — No, it is not an algebraic expression because it has no variable.

(iv) $6 + 3p$ — Yes, it is an algebraic expression having variable p.

2. (i) $-15y$

= y is multiplied by (-15).

(ii) $31x + \frac{1}{2}$

$= \frac{1}{2}$ is added to the product of x and 31.

(iii) $3n - 2$

$= 2$ is subtracted from the product of 3 and n.

(iv) $z - 2$

$= 2$ is subtracted from z

(v) $5z + 3$

$= 3$ is added to 5 times of z.

(vi) $\frac{x}{3} - 5$

$= 5$ is subtracted from one third of x.

3. (i) 5 added to thrice p

$= 3 \times p + 5 = 3p + 5$

(ii) x multiplied by 6

$= x \times 6 = 6x$

(iii) 15 less than the quotient of x by 3.

$= \frac{x}{3} - 15$

(iv) m increased by 8

$= m + 8$

(v) 9 subtracted from twice of z

$= 2z - 9$

(vi) P taken away from five times of y

$= 5y - P$

4. Aarti's present age = x

(i) Aarti's age 10 years from now = $(x + 10)$ years

(ii) Aarti's age 3 years ago = $(x - 3)$ years

(iii) Her father's age = $(2 \times x + 5)$ years

$= 2x + 5$ years

5. The side of an equilateral triangle = y cm

$\therefore$ Perimeter of equilateral triangle = $3 \times$ side

$= 3 \times y$ cm

$= 3y$ cm

6. Ravi's cousin's age = x years

Ravi's age = $(2 \times x - 18)$ years

$= (2x - 18)$ years

7. (i) 2, 4, 6, 8, 10, ……

General term is = $2 \times n = 2n$

(ii) 3, 5, 7, 9, 11, ……

general term is = $2n + 1$

(iii) 6, 11, 16, 21, ……

general term is = $5n + 1$

8. Speed of bus = x km/hr

Distance from Delhi to Bikaner

$= (6 \times x + 100)$ km

$= (6x + 100)$ km

9. Height of a rectangular carton = h cm

Length of a rectangular carbon = $(3 \times h + 2)$ cm

$= 3h + 2$ cm

and Breadth of a rectangular = length -4 cm

$= (3h + 2) - 4$ cm

Exercise 7.3

1. (i) $(8 - 3) > 5$

Here, the given expression is not an equation because this expression is not with equality sign.

(ii) $7n = 21$

Yes, this expression is an equation because it is with equality sign with variable n.

(iii) $2m + 3 = 5$

Yes, this expression is an equation because it is with equality sign with variable m.

(iv) $x + 6 < 13$

Here, the given expression is not an equation because this expression is not with equality sign.

(v) $\frac{8}{z} = 4$

Yes, this expression is an equation because it is with equality sign with variable z.

(vi) $6 \times 4 - 17 < 9$

Here, the given expression is not an equation because this expression has no variable and equality sign.

2. (i) $7\,p = 28$

To find the value of p, we have to divide 28 by 7,

$\therefore \quad p = \frac{28}{7}$

$p = 4$

(ii) $\frac{p}{3} = 14$

To find the value of P, we have to multiply 14 by 3,

$\therefore \quad p = 14 \times 3$

$p = 42$

(iii) $z + 10 = 40$

To find the value of z, we have to subtract 10 from 40,

$\therefore \quad z = 40 - 10$

$z = 30$

(iv) $4y = 44$

To find the value of y, we have to divide 44 by 4,

$\therefore \quad y = \frac{44}{4}$

$y = 11$

(v) $x - 9 = 7$

To find the value of x we have to add 9 to 7,

$\therefore \quad x = 7 + 9$

$x = 16$

(vi) $x - 11 = 0$

To find the value of x, we have to add 11 to 0,

$x = 0 + 11$

$x = 11$

Chapter 8 : RATIO AND PROPORTION

Exercise 8.1

1. (i) 24 cm to 4 m

$= 24$ cm to 400 cm

$= \frac{24}{400} = \frac{12}{200} = \frac{6}{100} = \frac{3}{50} = 3 : 50$

(ii) 75 paise to ₹ 3

$= 75$ paise to 300 paise

$= \frac{75}{300} = \frac{25}{100} = \frac{5}{20} = \frac{1}{4} = 1 : 4$

(iii) 30 minutes to 1 hour

$= 30$ minutes to 60 minutes

$= \frac{30}{60} = \frac{3}{6} = \frac{1}{2} = 1 : 2$

(iv) 350 gm to 10 kg

$= 350$ gm to 10000 gm

$= \frac{350}{10000} = \frac{35}{1000} = \frac{7}{200} = 7 : 200$

(v) 5 km to 35 m

$= 5000$ m to 35 m

$= \frac{5000}{35} = \frac{1000}{7} = 1000 : 7$

(vi) 16 hours to 2 days

$= 16$ hours to 48 hours

$= \frac{16}{48} = \frac{8}{24} = \frac{4}{12} = \frac{1}{3} = 1 : 3$

2. (i) $18 : 20$ or $3 : 5$

$\frac{18}{20}$ or $\frac{3}{5}$

$\frac{18}{20} \times \frac{3}{5}$

$18 \times 5 \qquad 20 \times 3$

$90 \qquad > \qquad 60$

$\therefore$ $18 : 20$ is larger ratio.

(ii) $5 : 8$ or $4 : 5$

$\frac{5}{8} \times \frac{4}{5}$

$5 \times 5 \qquad 8 \times 4$

$25 \qquad < \qquad 32$

$\therefore$ $4 : 5$ is larger ratio.

3. Fill ups :

(i) $\frac{28}{40} = \frac{\quad}{10} = \frac{14}{\quad}$

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

Now, $\frac{7 \times 2}{10 \times 2} = \frac{14}{20}$

(ii) $\frac{24}{36} = \frac{\quad}{6} = \frac{8}{\quad}$

$\frac{24 \div 6}{36 \div 6} = \frac{4}{6}$

Now, $\frac{4 \times 2}{6 \times 2} = \frac{8}{12}$

4. Total no. of fruits = 50

Total no. of apples = 35

Total no. of mangoes = $50 - 35 = 15$

(i) Ratio of the no. of apples to the no. of mangoes

$= 35 : 15$

$= \frac{35}{15} = \frac{7}{3} = 7 : 3$

(ii) Ratio of the no. of mangoes to the no. of apples = $15 : 35$

$\frac{15}{35} = \frac{3}{7} = 3 : 7$

5. Sum of ratios = $2 + 3 = 5$

Rinki's share = $\frac{2}{5} \times 20 = ₹\ 8$

Teena's share = $\frac{3}{5} \times 20 = ₹\ 12$

6. No. of Toffees given by Ram to Sita = 34

No. of Toffees given by Ram to Somya = 68

Required ratio = $34 : 68$

$= \frac{34}{68} = \frac{1}{2} = 1 : 2$

7. Income of the family = $11x$

Saving of the family = $2x$

Saving = ₹ 760

$\therefore \quad 2x = ₹\ 760$

or $\quad x = ₹\ \frac{760}{2}$

$x = ₹\ 380$

$\therefore$ Income = $11x = 11 \times 380$

$= ₹\ 4180$

So, expenditure of the family = ₹ (4180 – 760)

= ₹ 3420

8. Let first number be = $8x$

Second number be = $7x$

$\therefore \quad 8x + 7x = 60$

or $\quad 15x = 60$

or $\quad x = \frac{60}{15}$

$x = 4$

$\therefore$ First number = $8x = 8 \times 4 = 32$

Second number = $7x = 7 \times 4 = 28$

9. Present age of father = 48 years

Present age of his son = 18 years

(i) Ratio of present age of father to the present age of son = 48 : 18

$= \frac{48}{18} = \frac{24}{9} = \frac{8}{3} = 8 : 3$

(ii) When son was (18 – 7) = 11 years old then father was (48 – 7) = 41 years old.
So, ratio of age of father to the age of son = 41 : 11

(iii) After 12 years, the age of father will be (48 + 12) = 60 years and the age of son will be (18 + 12) = 30 years
So, ratio of father to the age of son

= 60 : 30

$= \frac{60}{30} = \frac{6}{3} = 2 : 1$

10. Alka's share $= \frac{600}{2000} = \frac{6}{20} = \frac{3}{10}$

Priya's share $= \frac{750}{3000} = \frac{75}{300} = \frac{25}{100} = \frac{5}{20} = \frac{1}{4}$

and, $\frac{3}{10} \times \frac{1}{4}$

$3 \times 4 \quad 10 \times 1$

$12 \quad > \quad 10$

Hence, Alka's share is greater than Priya.

Exercise 8.2

1. (i) 12, 14, 4, 7

$12 : 14 :: 4 : 7$

Product of extremes $= 12 \times 7 = 84$

Product of means $= 14 \times 4 = 56$

Here, product of extremes $\neq$ product of means

So, given numbers are not in proportion.

(ii) 32, 48, 70, 210

$32 : 48 :: 70 : 210$

Product of extremes $= 32 \times 210 = 6720$

Product of means $48 \times 70 = 3360$

Here, product of extremes $\neq$ product of means

so, given numbers are not in proportion.

(iii) 3, 5, 9, 15

$3 : 5 :: 9 : 15$

Product of extremes $= 3 \times 15 = 45$

Product of means $= 5 \times 9 = 45$

Here, product of extremes = product of means

so, given numbers are in proportion.

(iv) 15, 20, 30, 40

$15 : 20 :: 30 : 40$

Product of extremes $= 15 \times 40 = 600$

Product of means $= 20 \times 30 = 600$

Here, product of extremes = product of means

so, given numbers are in proportion.

2. (i) $27 : 15 :: 36 : x$

We know that,

Product of extremes = product of means

$$27 \times x = 15 \times 36$$

$$x = \frac{15 \times 36}{27}$$

$$x = 20$$

(ii) $12 : x :: 14 : 21$

We know that,

Product of extremes = Product of means

$$12 \times 21 = x \times 14$$

$$x = \frac{12 \times 21}{14}$$

$$x = 18$$

(iii) $13 : 169 :: 12 : x$

We know that,

Product of extremes = product of means

$$13 \times x = 169 \times 12$$
$$x = \frac{169 \times 12}{13}$$
$$x = 156$$

3. (i) $16 : 24 = 20 : 30$

$$\Rightarrow \quad \frac{16}{24} = \frac{20}{30}$$
$$\frac{2}{3} = \frac{2}{3}$$

$\therefore$ Both the ratios are equal. (True)

(ii) $21 : 6 = 35 : 10$

$$\frac{21}{6} = \frac{35}{10}$$
$$\frac{7}{2} = \frac{7}{2}$$

$\therefore$ Both the ratios are equal. (True).

(iii) $12 : 18 = 28 : 12$

Here, $\frac{12}{18} = \frac{2}{3}$, $\frac{28}{12} = \frac{7}{3}$

$$\frac{2}{3} \neq \frac{7}{3}$$

$\therefore$ Both the ratios are not equal. (False)

4. Let the third term be x.

Then $24 : 8 :: x : 5$

$$\therefore \quad \frac{24}{8} = \frac{x}{5}$$
$$\Rightarrow \quad 24 \times 5 = 8 \times x$$
$$\therefore \quad x = \frac{24 \times 5}{8}$$
$$x = 15$$

5. (i) 30 cm : 75 cm and 50 m : 125 m

$30 : 75 :: 50 : 125$

Here, $\frac{30}{75} = \frac{2}{5}$, $\frac{50}{125} = \frac{2}{5}$

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

Yes, both the ratios are in proportion.

And, middle terms = 75 and 50

Extreme terms = 30 and 125

(ii) 99 kg : 45 kg and ₹ 44 : ₹ 20

$99 : 45 = 44 : 20$

$$\frac{99}{45} = \frac{44}{20}$$

$$\frac{11}{5} = \frac{11}{5}$$

Yes, both the ratios are in proportion.

And, middle terms = 45 and 44

Extreme terms = 99 and 20

(iii) 45 girls : 60 girls and 48 boys : 64 boys

$45 : 60 :: 48 : 64$

$45 : 60 = 48 : 64$

$$\frac{45}{60} = \frac{48}{64}$$

$$\frac{3}{4} = \frac{3}{4}$$

Yes, both the ratios are in proportion.

And, middle terms = 60 and 48

Extreme terms = 45 and 64

6. Babita purchased 12 notebooks for = ₹ 96

$\therefore$ Cost of a notebook = $\frac{96}{12}$ = ₹ 8

Cost of 20 notebooks = ₹ 8×20 = ₹ 160

So, Raj has to pay ₹ 160 for 20 notebooks.

7. Let width of rectangle = x cm

then $5 : 2 :: 40 : x$

$$\frac{5}{2} = \frac{40}{x}$$

$$5 \times x = 40 \times 2$$

$$x = \frac{40 \times 2}{5}$$

$$x = 16$$

So, the width of rectangle is 16 cm.

8. (i) $\frac{5}{6} = \frac{n}{12}$

$6 \times n = 5 \times 12$

$\therefore \quad n = \frac{5 \times 12}{6}$

$n = 10$

(ii) $\frac{15}{25} = \frac{3}{x}$

$15 \times x = 3 \times 25$

$\therefore \quad x = \frac{3 \times 25}{15}$

$x = 5$

Exercise 8.3

1. Cost of a dozen (12) pencils = ₹ 36

Cost of one pencil = ₹ $\frac{36}{12}$ = ₹ 3

So, the cost of pencils per score = ₹ 3

2. Cost of 5 kg of rice = ₹ 150

Cost of 1 kg of rice = ₹$\frac{150}{5}$

Cost of 20 kg of rice = ₹ $\frac{150}{5} \times 20$

= ₹ 600

So, he will pay ₹ 600 for 20 kg of rice.

3. Distance travelled by car in 15 litres = 240 km

Distance travelled by car in 1 litre = $\frac{240}{15}$ km

Distance traveled by car in 20 litres = $\frac{240}{15} \times 20$ km

= 320 km

So, distance travelled by car in 20 litres is 320 km.

4. Cost of 60 envelopes = ₹ 90

Cost of 1 envelope = ₹ $\frac{90}{60}$

(i) Cost of 10 envelopes = ₹ $\frac{90}{60} \times 10$

= ₹ $\frac{90}{6}$ = ₹ 15

So, the cost of 10 envelopes is ₹ 15.

(ii) No. of envelopes for ₹ 30 = $\frac{60}{90} \times 30$ = 20 envelopes

So, 20 envelopes can be purchased for ₹ 30.

5. Distance travelled by an aeroplane in 5 hours = 4000 km

Distance travelled in an hour = $\frac{4000}{5}$

Distance travelled by in 3 hours = $\frac{4000}{5} \times 3$

= 2400 km

So, the aeroplane will fly 2400 km in 3 hours.

6. 6000 pencils are contained in = 48

1 pencils is contained in = $\frac{48}{6000}$

1875 pencils are contained in = $\frac{48}{6000} \times 1875$

= 15 boxes

So, 15 boxes will be needed for 1875 pens.

7. Cost of 35 apples = ₹ 80

Cost of an apple = ₹ $\frac{80}{35}$

Cost of 105 apples = ₹ $\frac{80}{35} \times 105$

= ₹ 240

So, the cost of 105 apples is ₹ 240.

8. Rent paid by Rashi for 4 months = ₹ 5500

Rent paid by Rashi for 1 month = ₹ $\frac{5500}{4}$

Rent paid by Rashi for a year (12 months) = ₹ $\frac{5500}{4} \times 12$

= ₹ 16500

So, Rashi has to pay ₹ 16500 for a whole year.

9. (i) Time taken by car to travel 165 km = 3 hours

Time taken by car to travel 1km = $\frac{3}{165}$ hours

Time taken by car to travel 440 km = $\frac{3}{165} \times 440$

= 8 hours

So, the car will take 8 hours to trave 440 km.

(ii) Distance travelled by car in 3 hours = 165 km

Distance travelled by car in an hour = $\frac{165}{3}$ km

Distance travelled by car in 7 hours = $\frac{165}{3} \times 7$ km

So, the car will travel 385 km in 7 hours.

10. Weight of 10 packets of soyabeans = 25 kg

Weight of 1 packet of soyabeans = $\frac{25}{10}$ kg

Weight of 28 packets of soyabeans = $\frac{25}{10} \times 28$

= 70 kg

So, the weight of 28 packets is 70 kg.

Chapter 9 : PERIMETER AND AREA

Exercise 9.1

1. (i) Perimeter of given figure = sum of all sides

= (6 + 15 + 6 + 15)

= 42 cm

(ii) Perimeter of given figure = sum of all sides

= (2 + 2 + 2 + 2 + 2 + 2) cm

= 12 cm

(iii) Perimeter of given figure = sum of all sides

= (1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1) cm

= 12 cm

(iv) Perimeter of given figure = sum of all sides
$= (2 + 3 + 1 + 4 + 4 + 1 + 3)$ cm
$= 18$ cm

(v) Perimeter of given figure = sum of all sides
$= (3 + 4 + 7 + 2 + 2)$ cm
$= 18$ cm

2. (i) Length of rectangle = 14 m
Breadth of rectangle = 5.5 cm
$\therefore$ Perimeter of rectangle $= 2 \times (l + b)$
$= 2 \times (14 + 5.5)$
$= 2 \times 19.5$
$= 39.0$ m

(ii) Length of rectangle = 70 cm
Breadth of rectangle = 12 cm
$\therefore$ Perimeter of rectangle $= 2 \times (l + b)$
$= 2 \times (70 + 12)$
$= 2 \times 82 = 164$ cm

3. (i) Side of square = 15.2 cm
Perimeter of square = 4 × side
$= 4 \times 15.2$
$= 60.8$ cm

(ii) Side of square = 32 cm
Perimeter of square = 4 × side
$= 4 \times 32$
$= 128$ cm

4. (i) 10 cm, 8 cm, 3 cm
Perimeter of triangle = sum of three sides
$= (10 + 8 + 3)$ cm
$= 21$ cm

(ii) Each side of triangle = 12 cm
$\therefore$ Perimeter of equi lateral triangle $= 3 \times$ side
$= 3 \times 12$ cm
$= 36$ cm

5. Side of a regular pentagon = 2.5 cm
$\therefore$ Perimeter of a regular pentagon = 5 × side
$= 5 \times 2.5$
$= 12.5$ cm

6. Side of a square shaped park = 60 m
$\therefore$ Perimeter of a square shaped park = 4 × side
$= 4 \times 60$
$= 240$ m
So, cost of fencing the park at the rate of ₹ 20 = ₹ 240×20
= ₹ 4800

7. Length of the land = 70 m
Breadth of the land = 50 m
∴ Perimeter of the land = $2 \times (l + b)$
$= 2 \times (70 + 50)$
$= 2 \times 120$
$= 240$ m
∴ Length of wire for 1 row = 240 m
Length of wire for 5 rows = 240×5
$= 1200$ m

8. Side of a square park = 120 m
Perimeter of a square park = $4 \times$ side
$= 4 \times 120$
$= 480$ m
∴ Required distance in 3 rounds taken by Yash = $480 \times 3 = 1440$ m
Now, length of a rectangular park = 150 m
Breadth of a rectangular park = 100 m
Perimeter of a rectangular park = $2 \times (l + b)$
$= 2 \times (150 + 100)$
$= 2 \times 250$
$= 500$ m
∴ Required distance in 3 rounds taken by Yashi
$= 500 \times 3 = 1500$ m
Here, it is clear that Yashi covers more distance in 3 rounds.

9. Two sides of a triangle = 15 cm and 20 cm
Perimeter of a triangle = 50 cm
∴ Perimeter of triangle = sum of three sides
$50 = 15 + 20 + x$
$50 = 35 + x$
$50 - 35 = x$
$x = 15$
So, the third side of triangle is 15 cm.

10. (i) Side of an equilateral triangle = 5 cm
∴ Perimeter of an equilateral triangle = $3 \times$ side
$= 3 \times 5 = 15$ cm

(ii) Sides of triangle = 3 cm, 4 cm and 5 cm
∴ Perimeter of triangle = Sum of three sides
$= (3 + 4 + 5)$ cm
$= 12$ cm

(iii) Equal sides of isosceles triangle = 6 cm
and third side of isosceles triangle = 7 cm
∴ Perimeter of isosceles triangle = Sum of three sides
$= (6 + 6 + 7)$ cm
$= 19$ cm

11. Length of rectangular backyard = 46 cm

Breadth of rectangular backyard = 45 cm

$\therefore$ Perimeter of rectangular backyard = $2 \times (l + b)$

$= 2 \times (46 + 45)$

$= 2 \times 91$

$= 182$ cm

Cost of fencing yard at the rate of ₹ 50

$=$ ₹ 182×50

$=$ ₹ 9100

So, Madhusudan needs to pay ₹ 9100.

12. Perimeter of square = 40 cm

$\therefore \quad 4 \times$ sides $= 40$

$$\text{side} = \frac{40}{4}$$

side = 10 cm

So, the side of square is 10 cm.

Exercise 9.2

1. (i) Length of rectangle = 10 m

Breadth of rectangle = 5 m

$\therefore$ Area of rectangle = $l \times b$

$= 10 \times 5$

$= 50\ \text{m}^2$

(ii) Length of rectangle = 50 m

Area of rectangle = $400\ \text{m}^2$

$\therefore$ Breadth of rectangle = $\dfrac{\text{Area}}{\text{Length}}$

$= \dfrac{400}{50} = 8$ m

(iii) Breadth of Rectangle = 20 m

Area of rectangle = $1600\ \text{m}^2$

$\therefore$ Length of rectangle = $\dfrac{\text{Area}}{\text{Breadth}}$

$= \dfrac{1600}{20} = 80$ m

(b) (i) Side of square = 21 m

Area of square = side × side

$= 21 \times 21\ \text{m}^2$

$= 441\ \text{m}^2$

(ii) Side of square = 2.6 m

Area of square = side × side

$= 2.6 \times 2.6$

$= 6.76\ \text{m}^2$

(iii) Side of square = 30 m

Area of square = side × side

$= 30 \times 30 = 900\ m^2$

2. (i) No. of squares = 21

Area of 1 fully filled square = 1 sq. cm

Area covered by 21 fully filled squares = $21 \times 1 = 21$ sq cm

(ii) No. of squares = 21

Area of 1 fully square = 1 sq cm

$\therefore$ Area covered by 21 fully filled squares = 21×1 sq cm

$= 21$ sq cm

(iii) No. of full squares = 14

No. of half squares = 3

Area of 1 full square = 1 sq cm

Area of $\frac{1}{2}$ filled square = $\frac{1}{2}$ sq cm

$\therefore$ Area covered by filled squares = $\left(14 \times 1 + 3 \times \frac{1}{2}\right)$

$= (14 + 1.5)$ sq cm

$= 15.5$ sq cm

3. (i) Length of Rectangle = 13 cm

Breadth of rectangle = 10 cm

$\therefore$ Area of rectangle = $l \times b$

$= 13 \times 10\ cm^2$

$= 130\ cm^2$

(ii) Length of rectangle = 4 m 25 cm = 4.25 m

Breadth of rectangle = 2 m 10 cm = 2.10 m

$\therefore$ Area of rectangle $l \times b$

$= 4.25 \times 2.10\ m^2$

$= 8.925\ m^2$

(iii) Length of rectangle = 27.5 cm

Breadth of rectangle = 16 cm

$\therefore$ Area of rectangle = $l \times b$

$= 27.5 \times 16\ cm^2$

$= 440\ cm^2$

4. (i) Side of square = 12 m

$\therefore$ Area of square = side × side

$= 12 \times 12\ m^2$

$= 144\ m^2$

(ii) Side of square = 11.2 cm

$\therefore$ Area of square = side × side

$= 11.2 \times 11.2 \text{ cm}^2$

$= 125.44 \text{ cm}^2$

(iii) Side of square = 1 m 12 cm = 1.12 cm

$\therefore$ Area of square = side × side

$= 1.12 \times 1.12 \text{ m}^2$

$= 1.2544 \text{ m}^2$

5. Area of rectangle = 285 cm^2

Breadth of rectangle = 15 cm

$\therefore$ Length of rectangle = $\frac{\text{Area}}{\text{Breadth}}$

$= \frac{285 \text{ cm}^2}{15 \text{ cm}} = 19 \text{ cm}$

6. Area of rectangle = 200 cm^2

Length of rectangle = 10 cm

$\therefore$ Breadth of rectangle = $\frac{\text{Area}}{\text{Length}}$

$= \frac{200 \text{ cm}^2}{10 \text{ cm}} = 20 \text{ cm}$

7. Length of garden = 120 m

Breadth of garden = 35 m

$\therefore$ Area of rectangular garden = $l \times b$

$= 120 \times 35 \text{ m}^2$

$= 4200 \text{ m}^2$

So, the area of rectangular garden is 4200 m^2

8. Length of plot = 30 m

Breadth of plot = 20 m

$\therefore$ Area of rectangular plot = $l \times b$

$= 30 \times 20 \text{ m}^2$

$= 600 \text{ m}^2$

Cost of rectangular plot of 1 m^2 = ₹ 6000

Cost of rectangular plot of 600 m^2 = ₹ 6000 × 600

= ₹ 3600000

So, the required cost of rectangular plot is ₹ 3600000.

9. Length of plot = 160 m

Breadth of plot = 82 m

Given : Perimeter of rectangular plot = Perimeter of square plot

$$2 \times (l + b) = 4 \times \text{side}$$

$$2 \times (160 + 82) = 4 \times \text{side}$$

$$2 \times 242 = 4 \times \text{side}$$

$$484 = 4 \times \text{side}$$

$$\therefore \quad \text{Side} = \frac{484}{4} = 121 \text{ m}$$

Side of square plot = 121 m

Now Area of rectangular plot = $l \times b$

$$= 160 \times 82 \text{ m}^2$$

$$= 13120 \text{ m}^2$$

Area of square plot = side × side

$$= 121 \times 121 \text{ m}^2$$

$$= 14641 \text{ m}^2$$

So, square plot has $(14641 - 13120) = 1521 \text{ m}^2$ more area than rectangular plot.

10. Length of room = 15 m

Breadth of room = 12 m

Area of room = $l \times b = 15 \times 12 \text{ m}^2 = 180 \text{ m}^2$

Side of square carpet = 12 m

Area of square carpet = side × side

$$= 12 \times 12 \text{ m}^2$$

$$= 144 \text{ m}^2$$

Uncovered area of room = $(180 - 144) \text{ m}^2$

$$= 36 \text{ m}^2$$

So, the uncovered area of room with carpet is 36 m^2.

11. Perimeter of a square = 24 cm

$$4 \times \text{side} = 24 \text{ m}$$

$$\therefore \quad \text{side} = \frac{24}{4} \text{ cm} = 6 \text{ cm}$$

$\therefore$ Area of square = side × side

$$= 6 \times 6 \text{ cm}^2$$

$$= 36 \text{ cm}^2$$

So, the area of square is 36 cm^2.

12. Area of rectangular wall = $\dfrac{\text{Total cost}}{\text{Cost of per sq. m}}$

$$= \frac{₹1000}{₹10} = 100 \text{ m}^2$$

Length of wall = 20 m

$\therefore$ Breadth of wall $= \frac{\text{Area}}{\text{Length}} = \frac{100\ \text{m}^2}{20\ \text{m}} = 5\ \text{m}$

So, the breadth of wall is 5 m.

13. Length of room = 5 m

Breadth of room = 4 m

Area of room = $l \times b$

$= 5 \times 4\ \text{m}^2 = 20\ \text{m}^2$

Side of square tile = 0.5 m

Area of square tile = side × side

$= 0.5 \times 0.5\ \text{m}^2$

$= 0.25\ \text{m}^2$

Required no. of tiles $= \frac{\text{Area of room}}{\text{Area of square tile}}$

$= \frac{20\ \text{m}^2}{0.25\ \text{m}^2} = \frac{2000}{25} = 80$

So, 80 tiles are required to cover the floor of the room

14. (i)

Area of I rectangular region = $l \times b = 10 \times 2\ \text{m}^2$

$= 20\ \text{m}^2$

Area of II rectangular region = $l \times b = 5 \times 1\ \text{m}^2$

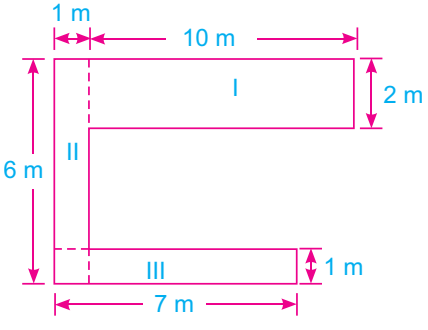
$= 5\ \text{m}^2$

Area of III rectangular region = $l \times b = 7 \times 1\ \text{m}^2$

$= 7\ \text{m}^2$

So, the total area of figure = $(20 + 5 + 7)\ \text{m}^2$

$= 32\ \text{m}^2$



(ii)

Area of I rectangular region = $l \times b = 3 \times 2\ \text{m}^2$

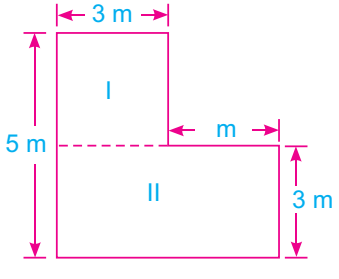
$= 6\ \text{m}^2$

Area of II rectangular region = $l \times b = 6 \times 3\ \text{m}^2$

$= 18\ \text{m}^2$

So, the total area of figure = $(6 + 18)\ \text{m}^2$

$= 24\ \text{m}^2$



Chapter 10 : DATA HANDLING

Exercise 10.1

1. (i) **Raw data :** Data collected by the source in its original form is called **raw data**.

(ii) **Range :** The difference of the highest value and the lowest value of observations is called range.

(iii) **Frequency :** The number of times, the occurrence of each observation is called its frequency.2.

2.

Outcome of thrown dice	Tally marks	Frequency
1	|||	3
2	𝍸 |	6
3	𝍸 ||	7
4	𝍸	5
5	𝍸	5
6	||||	4
	Total	30

(a) 3 appears the maximum no. of times.
(b) 4 and 5 appear equal no. of times.
(c) 1 appears the least no. of times.

3.

Height of students (in cm)	Tally marks	Frequency
128	|	1
129	|	1
132	||||	4
133	||	2
134	|||	3
143	||	2
144	||	2
150	|	1
152	|	1
154	||	2
158	|	1
	Total	20

(a) The height of the tallest child is 158 cm.
(b) The height of the shortest child is 128 cm.
(c) No. of students taller than 150 cm
$= 1 + 2 + 1 = 4$
(d) Hari's height = 150 cm
Height of the shortest child = 128 cm
Difference = (150 – 128) cm
= 22 cm

4.

Size of shoes	Tally marks	Frequency
4	𝍸 |	6
5	𝍸 |	6
6	𝍸 |	6
7	𝍸	5
8	𝍸	5
	Total	28

(a) Range of shoe sizes = highest value – lowest value
= 8 – 4 = 4

(b) No. of shoe size having more frequency are 4, 5 and 6.

5.

No. of children	Tally marks	Frequency
1	| | |	3
2	| | |	3
3	𝍸	5
4	| |	2
5	|	1
7	|	1
	Total	15

Exercise 10.2

Here 1 ☺ = 100 patients

Days	No. of students
Mon	☺☺☺☺☺☺
Tues	☺☺☺☺☺
Wed	☺☺☺☺
Thurs	☺☺☺☺☺
Fri	☺☺☺
Sat	☺☺☺☺
Sun	☺

(i) There is only one patient in the hospital on Sunday.

(ii) The maxium no. of patients in the hospital is on Monday.

Here 1 = 10 items

2.

Food Items	No. of items
Biscuits	
Chapati	
Noodles	
Bread	
Others	

3. Here, 1 = 100 students

Years	No. of students
1996	
1998	
2000	
2002	
2004	

(i) In 2002, there are 6 symbols. (ii) In 1998, there are 5 symbols.

4. Here 1 fruit symbol = 12 fruits

(i) No. of apples = $6 \times 12 = 72$

(ii) Coconut is the minimum fruit bought by the fruit seller.

(iii) He bought 5 kinds of fruits. (iv) No. of bananas = $7 \times 12 = 84$

5. Here 1 = 500 computers.

(i) No. of sold computers in April

$$= 3\frac{1}{2} \times 500$$

$$= \frac{7}{2} \times 500 = 1750 \text{ computers}$$

(ii) Total no. of computers sold in the six months are

In January $= 2 \times 500 = 1000$

In February $= 3 \times 500 = 1500$

In March $= 1 \times 500 = 500$

In April $= 3\frac{1}{2} \times 500 = 1750$

In May $= 4\frac{1}{2} \times 500 = 2250$

In June $= 5 \times 500 = 2500$

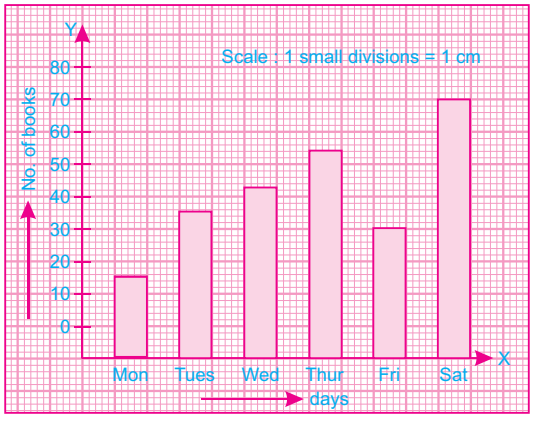
Total = 9500 computers

(iii) In June, there was maximum sale of computers.

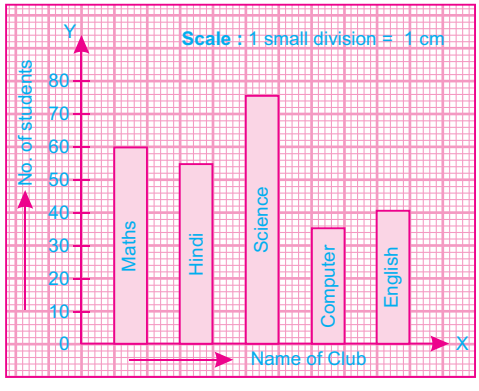
(iv) In March, there was least no. of computers sold.

Exercise 10.3

1.



2.

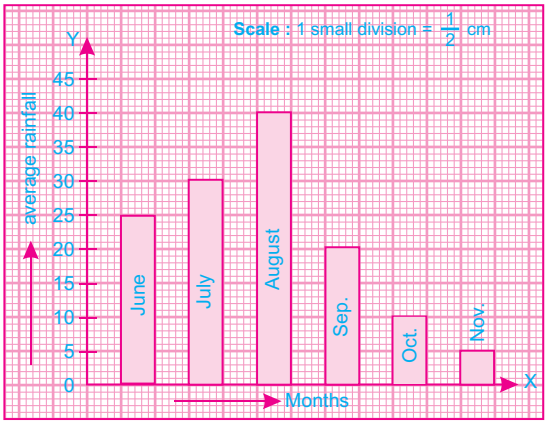


3. (i) Cricket and football are the most popular games.
(ii) 300 students like badminton.
(iii) 300 students.
(iv) Chess is the least popular game.

4. (i) Given bar graph gives the information about Indian rivers and their lengths in km.
(ii) Cauvery river is the smallest in length.
(iii) Brahmaputra and Indus have equal lengths.
(iv) The ratio of lengths of river Ganga and Brahmaputra

$$= \frac{2500 \text{ km}}{2900 \text{ km}} = 25 : 29$$

5.



Chapter 11 : BASIC GEOMERICAL IDEAS

Exercise 11.1

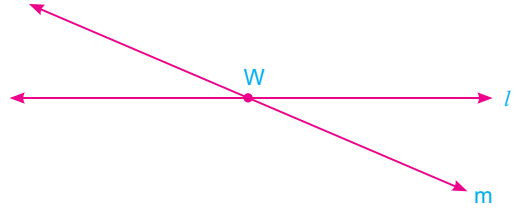
1. (i) Non-collinear points = D and E
(ii) Two collinear points = A and B

2. (i) $(l, p), (l, q), (m, p), (m, q), (n, p)$ and (n, q)
(ii) $l \parallel m$, $m \parallel n$ and $n \parallel l$
(iii) Lines p and l having a point of intersection P.
(iv) Lines q and m having a point of intersection C.
(v) Line p has A, P, Q and R; and line q has A, B, C and D collinear points.

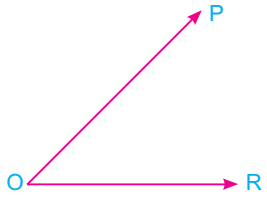
3. (i)

(ii)

(iii)



(iv)



4. (i) Marked points in the figure are A, B, C, D, E, F, G and H
(ii) There are 12 line segments
$AB, BC, CG, GH, HE, EF, CD, AD, AE, BF, DH$ and GF
(iii) Line segments meeting at point F are BF, EF and GF
(iv) Line segments meeting at point B are AB, CB and FB

5. (i) Line (ii) Line (iii) Point
(iv) 90° (v) No

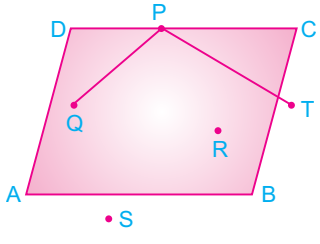
6. (i) There are three maximum points of intersection of three lines on a surface.
(ii) There is zero minimum point of intersection of three lines on a surface.

Exercise 11.2

1. (i) Open curve (ii) Closed curve
(iii) Open curve (iv) Closed curve
(v) Open curve

2. (i) Simple closed curve (ii) Non-simple closed curve
(iii) Simple closed curve (iv) Non-simple closed curve (figure is overlapped)
(v) Simple closed curve

3.



4. (i) Yes, it is a polygon having 3 line segments
(ii) No.
(iii) Yes, it is a polygon having 12 lines segments
(iv) Yes, it is a polygon having 5 lines segments
(v) No.

5. (i) $MNOPQR$ (ii) MN, NO, OP, PQ, QR, RM
(iii) M, N, O, P, Q, R (iv) $QM, MO, OQ, RN, NP, PR, QN, RO, RQ, QP$
(v) M, N

Exercise 11.3

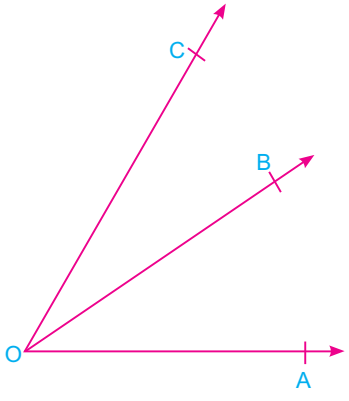
1. (i) $\angle AOB$ Vertex $\rightarrow O$, Arms $\rightarrow \overrightarrow{OA}$ and $\overrightarrow{OB}$

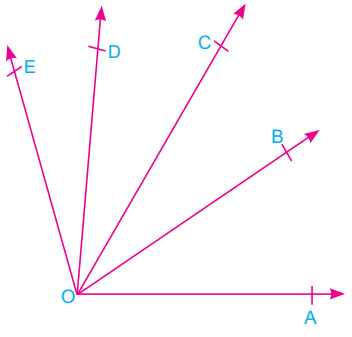
(ii) $\angle XYZ$ Vertex $\rightarrow Y$, Arms $\rightarrow \overrightarrow{YX}$ and $\overrightarrow{YZ}$

(iii) $\angle PQR$ Vertex $\rightarrow Q$, Arms $\rightarrow \overrightarrow{QP}$ and $\overrightarrow{QR}$

2. Interior points = D and E Exterior points = F and G
On the sides points = H and I

3. (i) (ii)





4. The angles are in the given figure
$\angle DAB, \angle ABC, \angle BCD$ and $\angle CDA$

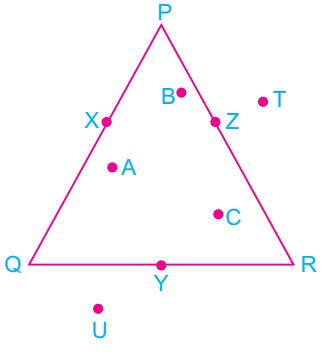
5. (i) 3 (ii) 3 (iii) 3

6. Name of different triangles in the given figure are :
ΔABC, ΔADE, ΔBDC, ΔBEC, ΔDEB, ΔEDC, ΔBFC and ΔDFE

7. (i) the points in the interior of ΔXYZ are C and E
(ii) The points lie on ΔXYZ are A and B
(iii) The points in the exterior of ΔXYZ are D and F

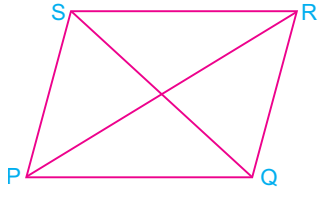
8. (i) The vertex opposite to the side $LM = N$
(ii) The vertex opposite to the side $MN = L$
(ii) The vertex opposite to the side $LN = M$

9.



Exercise 11.4

1.

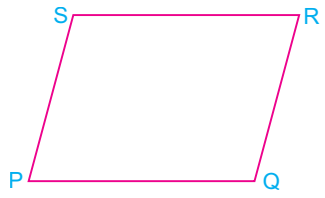


Diagonals of quadrilateral $PQRS$ are : PR and SQ

2. (i) 4 (ii) 4 (iii) 2 (iv) Opposite

3. (i) The points lie in the interior of quadrilateral $PQRS$ = K and L
(ii) The points lie in the exterior of quadrilateral $PQRS$ = X and M
(iii) The points lie on the quadrilateral $PQRS$ = R and W

4.



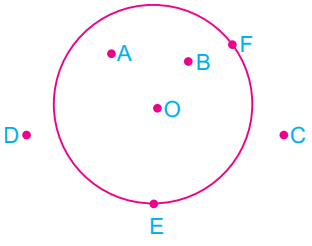
(i) Angle opposite to $\angle S = \angle Q$
(ii) Side opposite to $\overline{QR} = \overline{PS}$
(iii) Angles adjacent to $\angle Q$ and $\angle R$
(iv) Side adjacent to $\overline{PS} = \overline{PQ}$

Exercise 11.5

1. **(i) Diameter :** The diameter of a circle is a line segment passing through its centre.
(ii) Semi-circle : A diameter divides the circle into equal parts called semi-circles.
(iii) Sector : The area bounded by an arc and the two radii joining the end point of the arc with the centre is called a sector.
(iv) Circumference : The perimeter of a circle is known as its circumference. The word circumference is also referred to the length of the circle.

2. (i) equal (ii) 2 (iii) centre (iv) two
(v) equidistance

3.



4. (i) radius = 3 cm
$\therefore$ diameter = $2 \times$ radius
$= 2 \times 3$ cm
$= 6$ cm

(ii) radius = 8.5 cm
$\therefore$ diameter = $2 \times$ radius
$= 2 \times 8.5$ cm
$= 17.0$ cm

(iii) radius = 8 cm
$\therefore$ diameter = $2 \times$ radius
$= 2 \times 8$ cm
$= 16$ cm

5. (i) diameter = 4 cm
$\therefore$ radius = $\frac{\text{diameter}}{2} = \frac{4}{2}$ cm = 2 cm

(ii) diameter = 9 cm

$\therefore$ radius $= \frac{\text{diameter}}{2} = \frac{9}{2}$ cm = 4.5 cm

(iii) diameter = 18 cm

$\therefore$ radius $= \frac{\text{diameter}}{2} = \frac{18}{2}$ cm = 9 cm

6. (i) Centre – O

(ii) Two diameters – AB and CD

(iii) Four radii – OA, OB, OC and OD

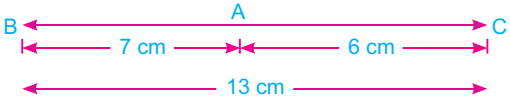
(iv) Two chords – BC and AD

(v) a sector – OAC

Chapter 12 : UNDERSTANDING ELEMENTARY SHAPES

Exercise 12.1

1.



Here, $\overline{BA} + \overline{AC} = \overline{BC}$

So, B does not lie between A and C.

Hence, point A lies between B and C.

2. (i) Here, $AB = CD$

(iii) Here, $RS > PQ$

(ii) $DE < FG$

3.

Since, T is mid point of $\overline{PQ}$

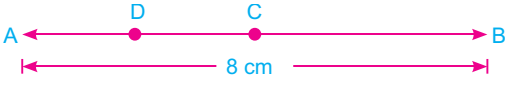
$\Rightarrow$ $PT = TQ$

and Q is mid point of $\overline{TR}$

$\Rightarrow$ $TQ = QR$

So, $PT = QR$

4.



Since C is mid point of AB

$\therefore$ $AC = \frac{1}{2} \times AB = \frac{1}{2} \times 8$ cm = 4 cm

Now, D is mid point of CA

$\therefore$ $DC = \frac{1}{2} \times AC = \frac{1}{2} \times 4$ cm = 2 cm

So, length of $DB = DC + BC$ [$\because BC = AC$]

$= DC + AC$

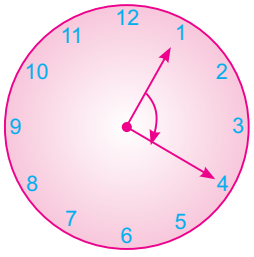
$= (2 + 4)$ cm

$= 6$ cm

5. There are 6 angles shown in the figure.

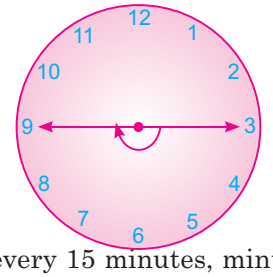
$\angle AOB, \angle BOC, \angle COD, \angle AOC, \angle AOD, \angle BOD$

6. (i) 1 to 4



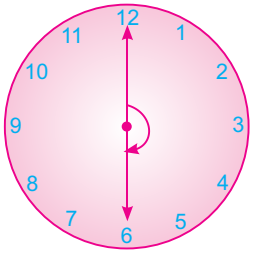
⇒ We know that after every 15 minutes, minutes-hand of a clock measures 90°. So when it moves from 1 to 4 (15 minutes) it makes 1 right angle.

(ii) 3 to 9



We know that after every 15 minutes, minutes-hand of a clock measures 90°. So, when it move from 3 to 9 (30 minutes) it makes 2 right angles.

(iii) 12 to 6

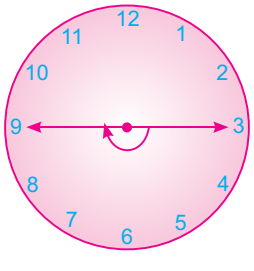


(We know that after every 15 minutes, minutes-hand of a clock measures 90°. So, when it moves from 12 to 6 (30 minutes) it makes 2 right angles.

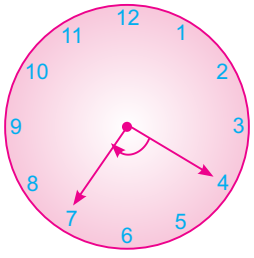
7. (i) right angle (ii) acute angle

(iii) obtuse angle (iv) straight angle

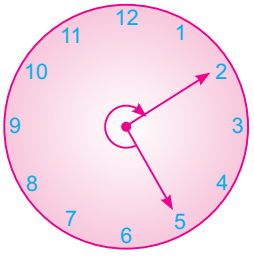
8. (i) If the hours hand of a clock starts at 3 and makes $\frac{1}{2}(180°)$ of a revolution then it will stop at 9.



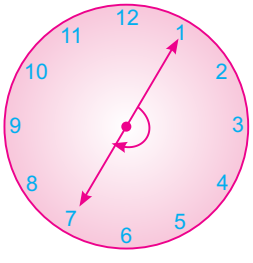
(ii) If the hours hand of a clock starts at 4 and makes $\frac{1}{4}(90°)$ of a revolution then it will stop at 7.



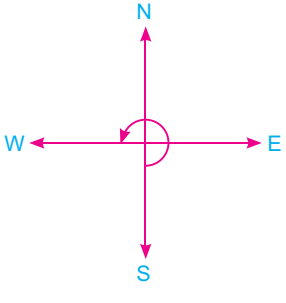
(iii) If the hours hand of a clock starts at 5 and makes $\frac{3}{4}(270°)$ of a revolution then it will stop at 2.



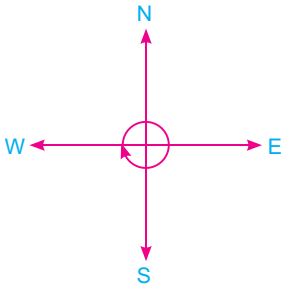
(iv) If the hours hand of a clock starts at 1 and makes $\frac{1}{2}(180°)$ of a revolution then it will stop at 7.



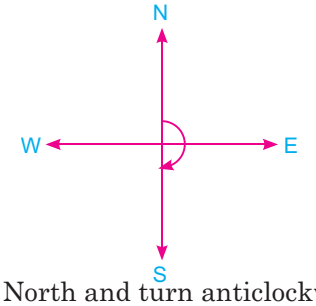
9. (i) If we start facing from south and turn anticlockwise to west then it makes 3 right angles.



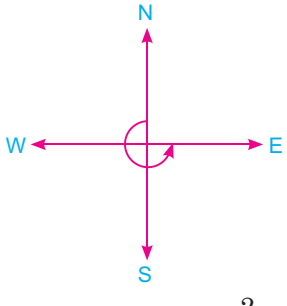
(ii) If we start facing from west and turn clockwise to west then it makes 4 right angles.



(iii) If we start facing from North and turn clockwise to South then it makes 2 right angles.



(iv) If we start facing from North and turn anticlockwise to East then it makes 3 right angles.



10. (i) $\frac{1}{2}$ of straight angle

$= \frac{1}{2} \times 180° = 90°$

(ii) $\frac{2}{5}$ of right angle

$= \frac{2}{5} \times 90° = 36°$

(iii) $\frac{4}{5}$ of complete angle

$= \frac{4}{5} \times 360° = 288°$

(iv) $2\frac{1}{2}$ of right angle

$= \frac{5}{2} \times 90° = 225°$

11. If the seconds hand of a clock makes five and a half turns, then no. of right angles is

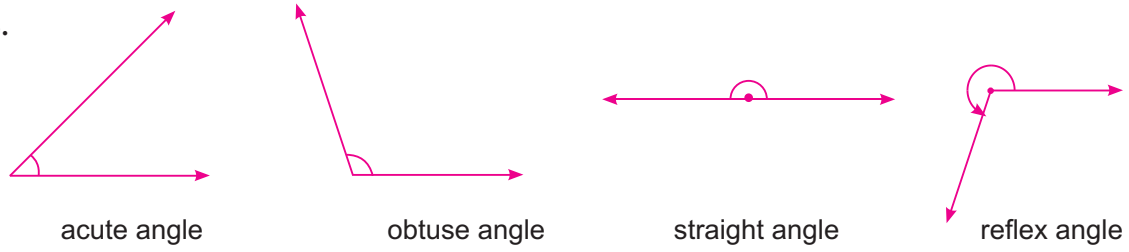
$\therefore$ in a turn it measures = 4 right angles

in $5\frac{1}{2}$ turns it measures $= 5\frac{1}{2} \times 4$

$= \frac{11}{2} \times 4$

= 22 right angles.

12.



acute angle obtuse angle straight angle reflex angle

Exercise 12.2

1. (i) 1 right angle = 90° (ii) $\frac{1}{4}$ revolution = $\frac{1}{4} \times 360° = 90°$

(iii) $\frac{3}{4}$ revolution = $\frac{3}{4} \times 360° = 270°$ (iv) 1 straight angle = 180°

2. Angles less than 90° are acute.

So, 75°, 60° and 40° are acute angles.

Angles more than 90° and less than 180° are obtuse. So, 120°, 115° and 135° are obtuse angles.

Angles more than 180° and less than 360° are reflex. So, 290° and 305° are reflex angles.

3. (i) Here, $a + 20° = 90°$

$a = 90° - 20°$

$a = 70°$

(ii) Here, $41° + b = 90°$

$b = 90° - 41°$

$b = 49°$

4. (i) $CE = 2$ units

$EG = 2$ units

So, $CE = EG$

Yes, PE bisects CG as $CE = EG$

(ii) PE is perpendicular bisector of $\overline{DF}$ and $\overline{CG}$.

5. (i) On the basis of sides = isosceles triangle

On the basis of angles = acute angled triangle.

(ii) On the basis of sides = equilateral triangle

On the basis of angles = acute angled triangle.

(iii) On the basis of sides = isosceles triangle

On the basis of angles = acute angled triangle.

(iv) Acute angled triangle.

(v) Right angled triangle

(vi) Obtuse angled triangle.

6. (i) In $\Delta\ LMN$, $\angle\ L = 95°$ $(95° > 90°)$ so it is an obtuse angled triangle

(ii) In $\Delta\ PQR$, $\angle\ P = 90°$ so it is a right angled triangle.

(iii) In $\Delta\ TUV$, $TU = UV = 24$ cm

So it is an isosceles triangle.

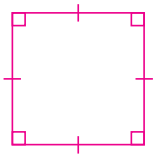
(iv) In $\Delta\ DEF$, $\angle\ E = 110°$ $(110° > 90°)$, so it is an obtuse angled triangle.

(v) In $\Delta\ ABC$, $AB = BC = CA = 7$ cm, so it is an equilateral triangle.

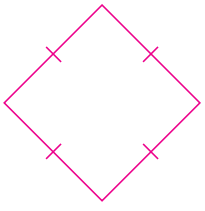
7. (i) True (ii) False (iii) True (iv) True (v) True

Exercise 12.3

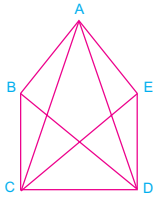
1. **Square :** A parallelogram in which all sides are equal and each angle measures 90° is called a square



Rhombus : A parallelogram is which all sides are equal is called a rhombus.



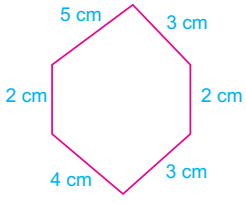
2. **Pentagon :**

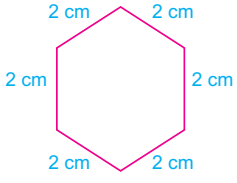


3. (i) False (ii) False (iii) False (iv) True (v) False

4. Two properties of parallelogram
(i) Opposite sides are parallel. (ii) Opposite sides are equal.

5. **Irregular Hexagon :** A hexagon with 6 unequal sides is called irregular hexagon.
Regular Hexagon : A hexagon with all 6 qual sides is called regular hexagon.





Exercise 12.4

1. (i) Sphere (ii) Cube (iii) Cylinder (iv) Cuboid (v) Cuboid

2. (i) Cuboid — It has 12 edges.
(ii) Cone — It has 1 curved edge.

3. (i) Length, Breadth and Height (ii) Cylinder
(iii) 8 (iv) Cube, 6
(v) Length, Breadth and Height

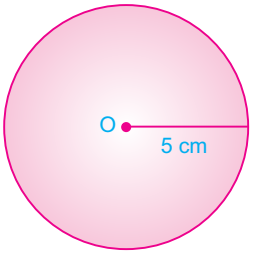
4. Matching
(i) Cuboid → (c) Match box, (ii) Cylinder → (d) Candle
(iii) Cone → (b) Ice-cream cone (iv) Sphere → (a) Ball

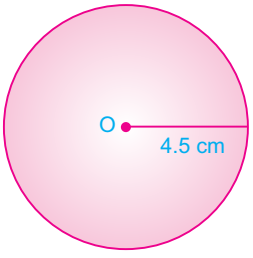
5. **Prism :** A prism is a solid that has two identical and parallel bases which are polygons. The rest of the faces are parallelograms.
Pyramid : A pyramid is a solid shape which has a single base as a polygon. The other faces of the pyramids are triangles that share a common vertex.

Chapter 13 : Practical Geometry

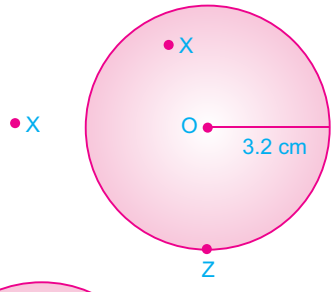
Exercise 13.1

1.

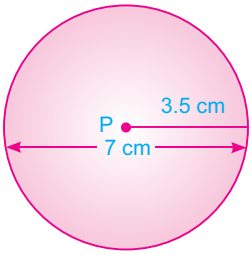




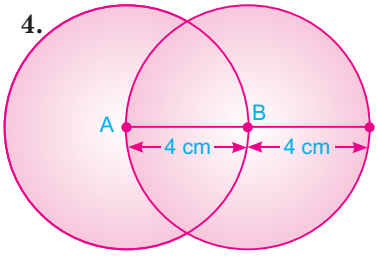
2.



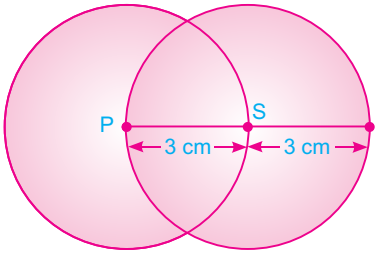
3.



4.



5.



(a) Yes, circle with centre S passes through point P.

(b) Yes, PS is the common radius of both the circles.

Exercise 13.2

1.

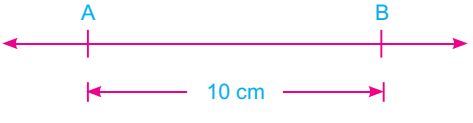
2. (i) Draw a line l.

(ii) Place the pointed tip of the compass on the zero mark of the ruler and adjust its opening so that the pencil tip touches the 3.8 cm mark.

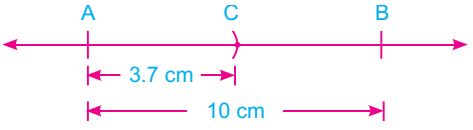
(iii) Now, with the same opening of the compass as in step (ii), take point A as centre and draw an arc cutting line l at point B.

$\therefore$ AB is the required line segment of length 3.8 cm.

3. By applying same above method we have a line segment AB of length 10 cm.



Now, from A as centre draw an arc of 3.7 cm cutting line segment AB at point C.



$\therefore$ $\overline{CB} = \overline{AB} - \overline{AC}$

$= (10 - 3.7)$ cm

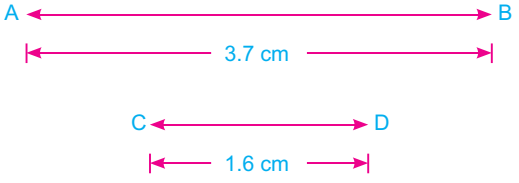
$= 6.3$ cm

Check : $\overline{AC} + \overline{CB} = \overline{AB}$

$(3.7 + 6.3)$ cm $= 10$ cm

10 cm $= 10$ cm

4. We have



(i) $\overline{PQ} = 2\overline{CD}$

$\overline{PQ} = 2 \times 1.6$

$= 3.2$ cm

Hence, by applying above method, construct a line segment PQ of length 3.2 cm

(ii) $\overline{PQ} = \overline{AB} + \overline{CD}$

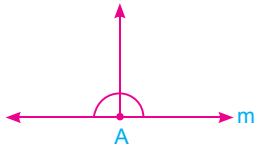
$= (3.7 + 1.6)$ cm $= 5.3$ cm

(iii) $\overline{PQ} = \overline{AB} - \overline{CD}$

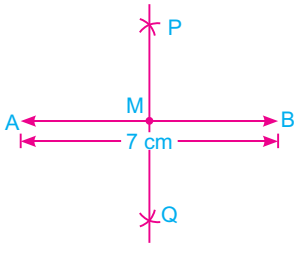
$= (3.7 - 1.6)$ cm $= 2.1$ cm

Exercise 13.3

1.



2.

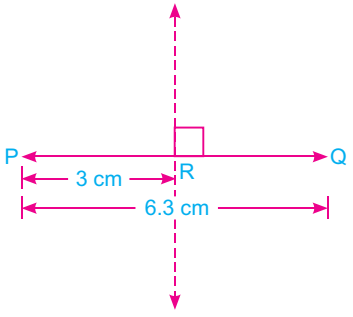


$\overline{AB} = 7$ cm

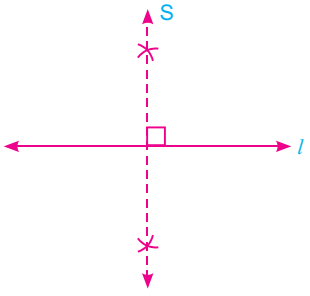
$\frac{1}{2}\overline{AB} = \frac{7}{2}$ cm $= 3.5$ cm

So, $AM = BM = 3.5$ cm

3.

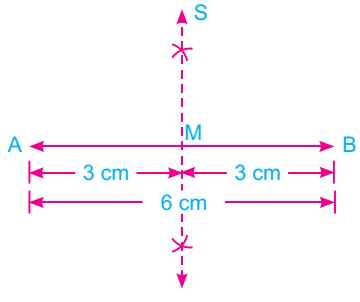


4.

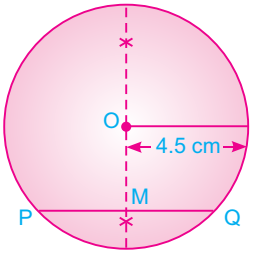


Exercise 13.4

1.



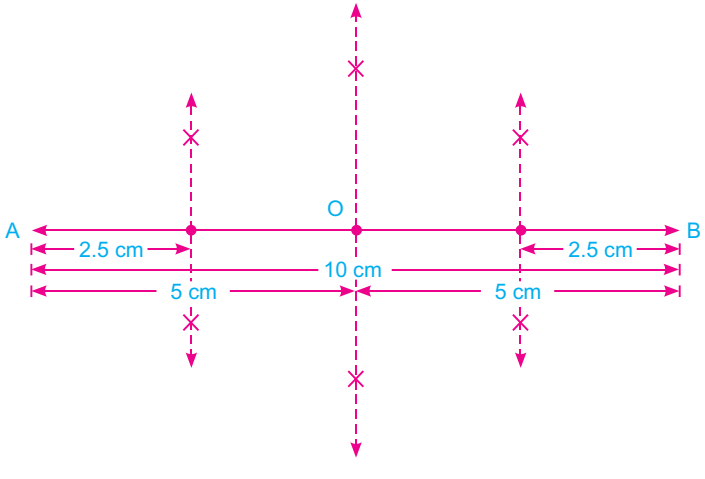
2. Yes, perpendicular bisector of PQ passes through the centre O.



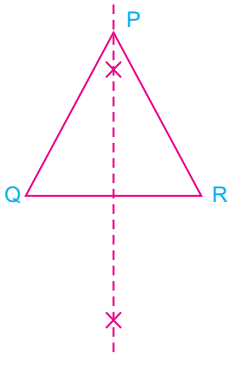
$$\therefore \quad AM = MB = \frac{1}{2} AB$$

$$= \frac{1}{2} \times 6 \text{ cm} = 3 \text{ cm}$$

3.

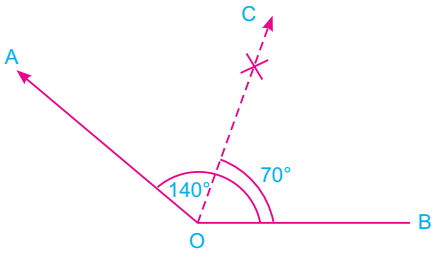


4.

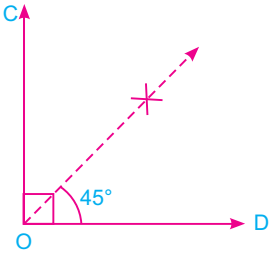


Exercise 13.5

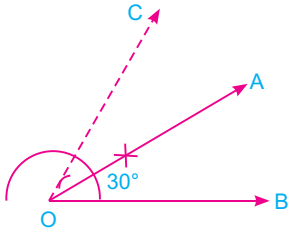
1.



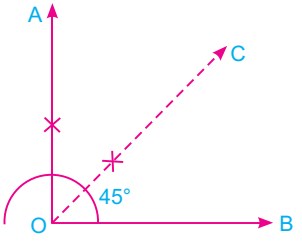
2.



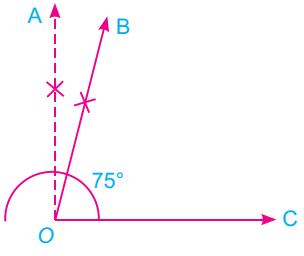
3. (i)



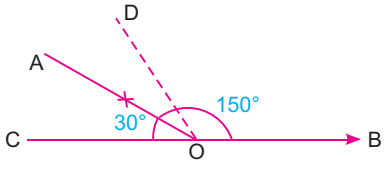
(ii)



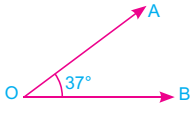
(iii)



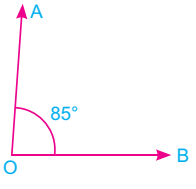
(iv)



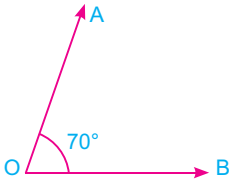
4. (i)



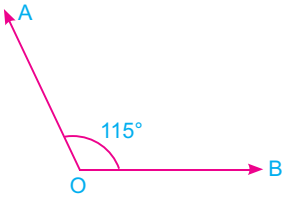
(ii)



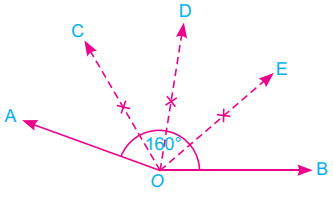
(iii)



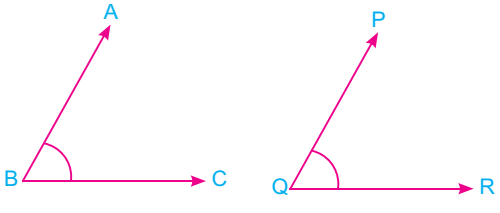
(iv)



5.

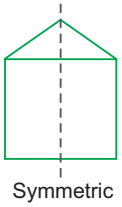


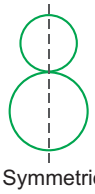
6.



Chapter 14 : Symmetry

Exercise 14.1

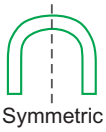
1. (i) 
Symmetric

(ii) 
Symmetric

(iii) 
Symmetric

(iv) Not symmetric

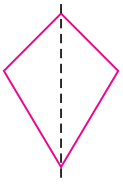
(v) Not symmetric

(vi) 
Symmetric

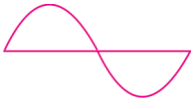
2. Leaves, butterfly, letter T.

3. In the given figure, line l_2 is the line of symmetry because it shows identical parts on either side of the line of symmetry.

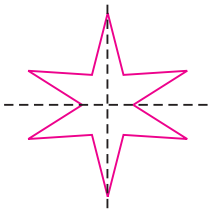
Exercise 14.2

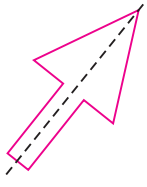
1. (i) 
1 Line of symmetry

(ii) 
No Line of symmetry

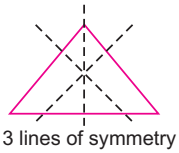
(iii) 
No Line of symmetry

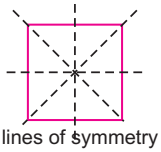
(iv) 
No Line of symmetry

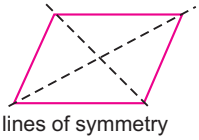
(v) 
Two Lines of symmetry

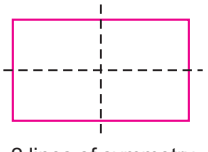
(vi) 
One Line of symmetry

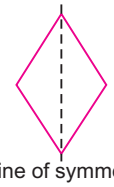
2. (i) 
No line of symmetry

(ii) 
3 lines of symmetry

(iii) 
4 lines of symmetry

(iv) 
2 lines of symmetry

(v) 
2 lines of symmetry

(vi) 
1 line of symmetry

3. There is no any line of symmetry in a parallelogram.

4. (i) The following English alphatbets have vertical lines of symmetry.

A, H, I, M, O, T, U, V, W, X, Y

(ii) The following English alphabets have horizontal lines of symmetry.

❑