Class VIII Session 2024-25
Subject - Mathematics
Sample Question Paper - 2

Time Allowed: 3 hours **Maximum Marks: 80**

General Instructions:

1. This Question Paper has 4 Sections A-D.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 6 questions carrying 02 marks each.
4. Section C has 8 questions carrying 03 marks each.
5. Section D has 6 questions carrying 04 marks each.
6. All Questions are compulsory.
7. Draw neat figures wherever required. Take π =22/7 wherever required if not stated

Section A

1. One (1) is: **[1]**

   a) the identity for the subtraction of rational numbers
   b) the identity for division of rational numbers
   c) the identity for the addition of rational numbers
   d) the identity for multiplication of rational numbers

2. Find $\frac{7}{8} + \left(-\frac{5}{16}\right) + \left(-\frac{3}{16}\right) + \frac{5}{8}$ **[1]**

   a) -16
   b) -21
   c) -1
   d) 1

3. Solve the following: (x + 1) + $\frac{1}{3}$ (x - 1) = $\frac{5}{12}$(x - 2) **[1]**

   a) $\frac{5}{12}$
   b) $\frac{-5}{12}$
   c) $\frac{-12}{5}$
   d) $\frac{12}{5}$

4. Find two parts of 34 such that $\left(\frac{4}{7}\right)^{\text{th}}$ of one part is equal to $\left(\frac{2}{5}\right)^{\text{th}}$ of the other. **[1]**

   a) 15, 19
   b) 16, 18
   c) 14, 20
   d) 16, 19

5. Two adjacent angles of a parallelogram are in the ratio 1 : 5. Then, all the angles of the parallelogram are **[1]**

   a) 85°, 95°, 85°, 95°
   b) 30°, 180°, 30°, 180°
   c) 45°, 135°, 45°, 135°
   d) 30°, 150°, 30°, 150°

6. The measure of each interior angle of a regular convex polygon is 156^o. The number of sides of the polygon is : **[1]**

   a) 8
   b) 10

c) 15 d) 12

7. Without doing any calculation, find the numbers which are surely perfect squares: **[1]**

a) 2657 b) 2673

c) 2025 d) 2688

8. A group of students decided to collect as many paise from each member of the group as is the number of members. If the total collection amounts to Rs.22.09, the number of members in the group is: **[1]**

a) 43 b) 37

c) 47 d) 107

9. The value of $(0.3)^3$ is _____. **[1]**

a) .27 b) 27

c) 0.027 d) 2.7

10. Which of the following is not a perfect cube? **[1]**

a) 10000 b) 1000000

c) 1000 d) 216

11. What will be the increase in an amount in 2 years by 10% annual compounded interest? **[1]**

a) of principal amount 50% b) of principal amount 30%

c) of principal amount 20% d) of principal amount 21%

12. If a shirt cost ₹64 after a 20% discount, what was its original price? **[1]**

a) ₹76.80 b) ₹86.80

c) ₹88 d) ₹80

13. x(x - 3) + 2 = ? **[1]**

a) $x^2 - 3x + 2$ b) $x^2 - 2x + 2$

c) $x^2 - 5x + 3$ d) $x^2 + 3x + 5$

14. Which of the following is true for a polyhedron? **[1]**

a) Faces = 5, Vertices = 1, Edges = 7 b) Faces = 4, Vertices = 5, Edges = 6

c) Faces = 5, Vertices = 6, Edges = 9 d) Faces = 18, Vertices = 10, Edges = 25

15. A cube whose side is 5 cm will have surface area is equal to **[1]**

a) $120\ cm^2$ b) $50\ cm^2$

c) $100\ cm^2$ d) $125\ cm^2$

16. The value of $(0.000064)^{\frac{5}{6}}$ is **[1]**

a) $\frac{32}{100000}$ b) $\frac{16}{10000}$

c) $\frac{32}{10000}$ d) $\frac{16}{100000}$

17. The value of $(12^2 + 5^2)^{\frac{1}{2}}$ is **[1]**

a) 13 b) 11

c) 15 d) 12

18. An agent receives a commission of ₹ 73 on sales of ₹ 1000. The commission he will get on sales of ₹ 100 is _____. **[1]**

a) ₹ 7.30 b) ₹ 6

c) ₹ 7 d) ₹ 6.30

19. Factorise: $x^2 + 8x + 16$ **[1]**

a) $(x + 4)^2$ b) $(x + 2)^2$

c) $(x + 3)^2$ d) $(x + 5)^2$

20. The factors of $x^2 + xy - 2xz - 2yz$ are **[1]**

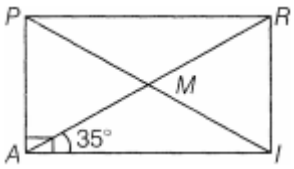
a) (x - y)(x - 2z) b) (x - y) (x + 2z)

c) (x + y) (x - 2z) d) (x + y)(x + 2z)

Section B

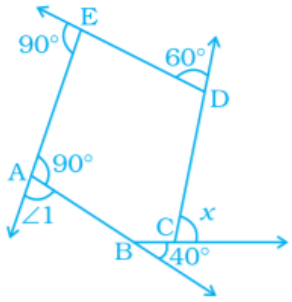
21. Solve the equations and check your result: 2x - 1 = 14 - x. **[2]**

22. In rectangle PAIR, find ∠ARI, ∠RMI and ∠PMA. **[2]**



OR

Find x in the following figure.



23. A dice is rolled. Find the probability of the event, a number greater than 5. **[2]**

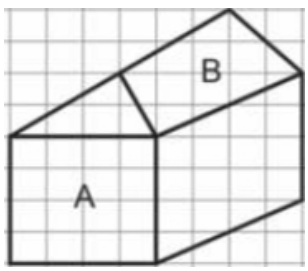
24. Find the smallest number by which of 100 must be multiplied to obtain a perfect cube. **[2]**

OR

Using prime factorisation, find the cube root of 2197.

25. Multiply the binomials: (y - 8) and (3y - 4) **[2]**

26. A sketch of a house on a grid is shown below. **[2]**



1 block represents one square unit.

Is face A identical to face B? Explain your answer.

27. Verify and name the property used **[3]**

$\left(\frac{-3}{5} \times \frac{12}{13}\right) \times \frac{7}{8} = \frac{-3}{5} \times \left(\frac{12}{13} \times \frac{7}{8}\right)$.

28. Solve: $\frac{x}{2} - \frac{1}{4}\left(x - \frac{1}{3}\right) = \frac{1}{6}(x + 1) + \frac{1}{12}$ **[3]**

OR

Solve the equations and check your result: $\frac{2x}{3} + 1 = \frac{7x}{15} + 3$

29. Find the square root of the following by long division method. **[3]**

i. 1369

ii. 5625

30. Vishakha offers a discount of 20% on all the items at her shop and still makes a profit of 12%. What is the cost price of an article marked at Rs 280? **[3]**

OR

The marked price of a DVD is ₹4500. A shopkeeper allows two successive discounts of 10% and 5% by the force of a customer. Find the selling price of the customer after two discounts are given.

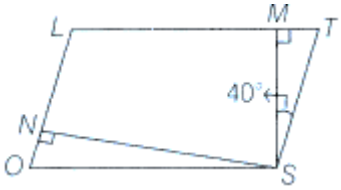
31. What must be added to $2m^2 - 3mn + 3n^2$ to get $5m^2 + 2mn + 7n^2$? **[3]**

32. How many small cubes with edge of 20cm each can be just accommodated in a cubical box of 2m edge? **[3]**

33. Find the value of : $\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-2}$ **[3]**

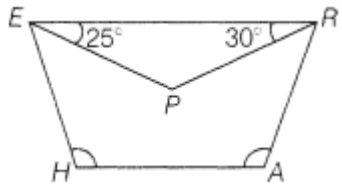
34. Work out the division: 96abc (3a – 12) (5b – 30) ÷ 144 (a – 4) (b – 6) **[3]**

35. In parallelogram LOST, SN⊥OL and SM⊥LT. Find ∠STM, ∠SON and ∠NSM. **[4]**



OR

In trapezium HARE, EP and RP are bisectors of ∠E and ∠R, respectively. Find ∠HAR and ∠EHA.



36. For the development of basic infrastructure in a district, a project of ₹108 crore approved by Development Bank is as follows: **[4]**

Item head	Road	Electricity	Drinking water	Sewerage
Amount (in ₹ crore)	43.2	16.2	27.00	21.6

Draw a pie chart for this data.

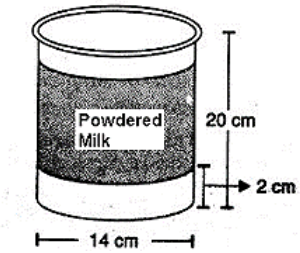
37. Raheem runs a readymade garment shop. He mark the garments at such a price that even after allowing a discount of 12.5%, gain a profit of 25%. Find the marked price of a jacket which costs him Rs. 2,100. **[4]**

OR

Fabina borrow ₹ 12500 at 12% per annum for 3 years at simple interest and Radha borrows the same amount for the same time period at 10% per annum, compounded annually. Who pays interest and by how much?

38. A company packages its milk powder in cylindrical container whose base has a diameter of 14 cm and height 20 cm. Company places a label around the surface of the container (as shown in the figure). If the label is placed 2 **[4]**

cm from top and bottom, what is the area of the label.



39. An electric pole, 14 metres high, casts a shadow of 10 metres. Find the height of a tree that casts a shadow of 15 metres under similar conditions. **[4]**

40. Draw a graph for the following. **[4]**

Side of square (in cm)	2	3	3.5	5	6
Perimeter (in cm)	8	12	14	20	24

i. Write the scale along the X axis and Y axis?

ii. What is marked on the horizontal axis?

iii. What is marked on the vertical axis?

iv. What is marked on the points plotted?

v. Is it a line graph?

Solution

Section A

1.

(d) the identity for multiplication of rational numbers

Explanation: One (1) is the identity for multiplication of rational numbers. That means, If a is a rational number. Then, a.1 = 1.a = a

2.

(d) 1

Explanation: $[\frac{7}{8} + (\frac{-5}{16})] + [(\frac{-3}{16}) + \frac{5}{8}]$

$= [\frac{7\times2+(-5)\times1}{16}] + [\frac{-3\times1+2\times5}{16}]$

$= [\frac{14-5}{16}] + [\frac{-3+10}{16}]$

$= \frac{9}{16} + \frac{7}{16}$

$= \frac{16}{16}$

$= 1$

3.

(c) $\frac{-12}{5}$

Explanation: $\frac{1}{2}$ (x + 1) + $\frac{1}{3}$ (x - 1) = $\frac{5}{12}$ (x - 2)

$\frac{x}{2} + \frac{1}{2} + \frac{x}{3} - \frac{1}{3} = \frac{5x}{12} - \frac{10}{12}$

$\frac{x}{2} + \frac{x}{3} - \frac{5x}{12} = \frac{-10}{12} + \frac{1}{3} - \frac{1}{2}$

$\frac{6x+4x-5x}{12} = \frac{-10+4-6}{12}$

$\frac{5x}{12} = \frac{-12}{12}$

$\frac{5x}{12} = -1$

x = $\frac{-12}{5}$.

4.

(c) 14, 20

Explanation: Let one part be x.

Then, other part be 34 - x.

According to question, we have

$\frac{4}{7}(x) = \frac{2}{5}(34 - x) \Rightarrow \frac{4x}{7} = \frac{68}{5} - \frac{2x}{5} \Rightarrow \frac{4x}{7} + \frac{2x}{5} = \frac{68}{5}$

$\Rightarrow \frac{20x+14x}{35} = \frac{68}{5} \Rightarrow \frac{34}{35} \times x = \frac{68}{5} \Rightarrow x = \frac{68}{5} \times \frac{35}{34}$

$\Rightarrow$ x = 2 $\times$ 7 $\Rightarrow$ x = 14

$\therefore$ One part = 14 and other part = 34 - 14 = 20

5.

(d) 30°, 150°, 30°, 150°

Explanation: Let the adjacent angles of a parallelogram be x and 5x, respectively.

Then, x + 5x = 180° [$\because$ adjacent angles of a parallelogram are supplementary]

$\Rightarrow$ 6x = 180°

$\Rightarrow$ x = 30°

$\therefore$ The adjacent angles are 30° and 150°.

Hence, the angles are 30°, 150°, 30°, 150° [$\because$ opposite angles are equal]

6.

(c) 15

Explanation: We know that Sum of all the Internal angles of polygon

= 180 $\times$ (n - 2)

According to question 180 (n - 2) = 156 $\times$ n

$\Rightarrow$ 180n - 360^o = 156n

$\Rightarrow$ 180n - 156n = 360

24n = 360

n = $\frac{360}{24}$ = 15

7.

(c) 2025

Explanation: 2025 is a perfect square as it ends with 5 at the unit's place whereas the other numbers 2657, 2688, and 2673 ends with 7, 8, and 3 at the unit's place and a perfect square never end with 2, 3, 7 and 8 at unit's place.

8.

(c) 47

Explanation: Number of members = $\sqrt{2209}$ = 47.

9.

(c) 0.027

Explanation: $(0.3)^3$ = 0.027

10. **(a)** 10000

Explanation: $\sqrt[3]{1000000}$ = 100 is a perfect cube.

$\sqrt[3]{216}$ = 6 is a perfect cube.

$\sqrt[3]{10000}$ = not a perfect cube.

11.

(d) of principal amount 21%

Explanation: Let Principal be ₹P

A = $P\left(1+\frac{1}{10}\right)^2$

= $P\left(\frac{11}{10}\right)^2$

A = $P \times \frac{121}{100}$

Percentage increase = $\frac{P\times\frac{121}{100}-P}{P} \times 100$

= 21%

12.

(d) ₹80

Explanation: Let the original CP be ₹ x.

$\therefore$ x $\times$ $\frac{80}{100}$ = 64 $\Rightarrow$ x = ₹80

13. **(a)** x^2 - 3x + 2

Explanation: x(x – 3) + 2

Open the brackets we get,

x^2 - 3x + 2

14.

(c) Faces = 5, Vertices = 6, Edges = 9

Explanation: Euler's formula for polyhedron is F + V - E = 2

F = 5, V = 6, E = 9

$\therefore$ F + V - E = 5 + 6 - 9 = 2, True

15.

(c) 100 cm^2

Explanation: Now, surface area of cube =$4(side)^2$

= $4 \times (5)^2$ = 100 cm^2

16. **(a)** $\frac{32}{100000}$

Explanation: $(0.000064)^{\frac{5}{6}} = \left(\frac{64}{1000000}\right)^{\frac{5}{6}}$

$= \left[\left\{\left(\frac{2}{10}\right)^6\right\}^{1/6}\right]^5 = \left(\frac{2}{10}\right)^5 = \frac{32}{100000}$

17. **(a)** 13

Explanation: $(12^2 + 5^2)^{\frac{1}{2}} = (144 + 25)^{\frac{1}{2}}$

$= (169)^{\frac{1}{2}}$

$= (13^2)^{\frac{1}{2}} = 13$

18. **(a)** ₹ 7.30

Explanation: Let commission received be ₹ y.

Sales (in ₹)	1000	100
Commission (in ₹)	73	y

It is a case of direct proportion.

Hence, $\frac{1000}{73} = \frac{100}{y} \Rightarrow$ y = ₹ 7.30

19. **(a)** $(x + 4)^2$

Explanation: $x^2 + 8x + 16$

By substituting, we get,

$= x^2 + 4x + 4x + 16$

By grouping

$= x(x + 4) + 4(x + 4)$

$= (x + 4)(x + 4)$

$= (x + 4)^2$

20.

(c) (x + y) (x - 2z)

Explanation: $x^2 + xy - 2xz - 2yz = x(x + y) - 2z(x + y)$

$= (x + y)(x - 2z)$

Section B

21. $2x – 1 = 14 – x$

$2x + x = 14 + 1$ ... [Transposing –x to L.H.S. and –1 to R.H.S.]

$\therefore 3x = 15$

$\therefore x = \frac{15}{3}$ ... [Dividing both sides by 3]

$\therefore x = 5$ this is the required solution.

Verification

L.H.S. $= 2x – 1 = 2(5) – 1 = 10 – 1 = 9$

R.H.S. $= 14 – x = 14 – 5 = 9$

Therefore, L.H.S. = R.H.S.

22. Given, $\angle RAI = 35^\circ$

$\therefore \quad \angle PRA = 35^\circ$ [PR || A I and AR is transversal]

$\Rightarrow \angle ARI = 90^\circ - \angle PRA$ = 90° - 35° = 55

$\because \quad AM = IM, \angle MIA = \angle MAI = 35^\circ$

In $\triangle AMI, \angle RMI = \angle MAI + \angle MIA = 70^\circ$ [exterior angle]

Also, $\angle RMI = \angle PMA$

$\Rightarrow \quad \angle PMA = 70^\circ$ [vertically opposite angles]

OR

From the given figure it is clear that

$\angle 1 + 90^o = 180^o$ (linear pair)

$\Rightarrow \angle 1 = 90^o$

Now, $\angle A + \angle B + \angle C + \angle D + \angle E = 360^o$[Sum of exterior angles of a polygon = 360^o]

$90^o + 40^o + x + 60^o + 90^o = 360^o$

$x + 280^o = 360^o$

$x = 80^o$

23. In throwing a die, possible outcomes of the number appearing on top face = (1, 2, 3, 4, 5, 6) = 6

Numbers greater than 5 = (6) = 1

Probability of getting number greater than 5

$= \frac{\text{Favourable outcomes}}{\text{total outcomes}}$

$= \frac{1}{6}$

24.

2	100
2	50
5	25
5	5
	1

Prime factors of 100 = $2 \times 2 \times 5 \times 5$

Here factor 2 and 5 both do not appear in 3's group.

Therefore 100 must be multiplied by 2×5 = 10 to make it a perfect cube.

OR

We have, 2197

13	2197
13	169
13	13
	1

Now, 2197 = 13 × 13 × 13

$\therefore \quad \sqrt[3]{2197} = 13$

25. (y - 8) × (3y - 4) = y(3y - 4) - 8(3y - 4)

= y × 3y - y × 4 - 8 × 3 y - 8 × -4

= $3y^2$ - 4y - 24y + 32

= $3y^2$ - 28y + 32

26.
- No face A is not identical to face B because face A is a square and face B is a rectangle.
- No face A is not identical to face B because area of both faces are not equal.

27. L.H.S.

$\left(\frac{-3}{5} \times \frac{12}{13}\right) \times \frac{7}{8}$

$= \left(\frac{-36}{65}\right) \times \frac{7}{8}$

$= \left(\frac{-63}{130}\right)$

R.H.S.

$\frac{-3}{5} \times \left(\frac{12}{13} \times \frac{7}{8}\right)$

$= \frac{-3}{5} \times \left(\frac{84}{104}\right)$

$= \frac{-3}{5} \times \left(\frac{21}{26}\right)$

$= \left(\frac{-63}{130}\right)$

Therefore, L.H.S = R.H.S.

Hence, verified.

The property is Associative i.e. (a×b)×c = a×(b×c).

28. Given, $\frac{x}{2} - \frac{1}{4}\left(x - \frac{1}{3}\right) = \frac{1}{6}(x + 1) + \frac{1}{12}$

$\Rightarrow \quad \frac{x}{2} - \frac{x}{4} + \frac{1}{12} = \frac{x}{6} + \frac{1}{6} + \frac{1}{12}$

$\Rightarrow \quad \frac{2x-x}{4} + \frac{1}{12} = \frac{x}{6} + \frac{2+1}{12}$

$\Rightarrow \quad \frac{x}{4} + \frac{1}{12} = \frac{x}{6} + \frac{3}{12}$

$\Rightarrow \quad \frac{x}{4} - \frac{x}{6} = \frac{3}{12} - \frac{1}{12}$ [transposing $\frac{x}{6}$ to LHS and $\frac{1}{12}$to RHS]

$\Rightarrow \quad \frac{6x-4x}{24} = \frac{3-1}{12}$

$\Rightarrow \quad \frac{2x}{24} = \frac{2}{12}$

$\Rightarrow \quad 2 \times 12x = 2 \times 24$ [by cross-multiplication]

$\Rightarrow$ 24x = 48

$\Rightarrow \quad \frac{24x}{24} = \frac{48}{24}$ [dividing both sides by 24]

$\therefore$ x = 2

OR

$\frac{2x}{3} + 1 = \frac{7x}{15} + 3$

$\frac{2x}{3} - \frac{7x}{15}$ = 3 - 1 ... [Transposing $\frac{7x}{15}$ to L.H.S. and 1 to R.H.S.]

$\therefore \frac{2x}{3} - \frac{7x}{15}$ = 2

$\therefore 15\left(\frac{2x}{3} - \frac{7x}{15}\right)$ = 2 $\times$ 15 ... [Multiplying both sides by 15]

$\therefore$ 10x – 7x = 30

$\therefore$ 3x = 30

$\therefore$ x = $\frac{30}{3}$ ... [Dividing both sides by 3]

$\therefore$ x = 10 this is the required solution.

Verification,

L.H.S. = $\frac{2x}{3} + 1 = \frac{2}{3}(10) + 1 = \frac{20+3}{3} = \frac{23}{3}$

R.H.S. = $\frac{7x}{15} + 3 = \frac{7}{15}(10) + 3 = \frac{70}{15} + 3 = \frac{70 \div 5}{15 \div 5} + 3 = \frac{14+9}{3} = \frac{23}{3}$

Therefore, L.H.S. = R.H.S.

29. i. We have, 1369

	37
3	13 69
	9
67	469
	469
	0

$\therefore \quad \sqrt{1369} = 37$

ii. We have, 5625

	75
7	56 25
	49
145	725
	725
	0

$\therefore \quad \sqrt{5625} = 75$

30. We have,

Marked Price = Rs 280

Discount = 20% of Rs 280

$= \frac{20}{100} \times 280$

= Rs 56

So, selling price = Rs (280 – 56)

= Rs 224

Now, Let the cost price be Rs 100

Profit = 12% of Rs 100

= Rs 12

So, selling price = Rs (100 + 12) = Rs 112

If the selling price is Rs 112 then cost price = Rs 100

If the selling price is Rs 224 then cost price = Rs $\left(\frac{100}{112} \times 224\right)$

= Rs 200.

OR

M.P. of DVD = ₹ 4500

First discount = 10% of ₹ 4500

$= \frac{10}{100} \times 4500 = ₹450$

Price after first discount = ₹ 4500 - ₹ 450= ₹ 4050

Second discount = 5% of reduced price

$= \frac{5}{100} \times Rs.4050 = \frac{20250}{100} = ₹202.50$

Net selling price of the DVD = ₹ 4050 - ₹ 202.50 = ₹3847.50.

31. Let the number added is x ,

$(2m^2 – 3mn + 3n^2) + x = (5m^2 + 2mn + 7n^2)$

$x = (5m^2 + 2mn + 7n^2) – (2m^2 – 3mn + 3n^2)$

$x = 5m^2 + 2mn + 7n^2 – 2m^2 + 3mn – 3n^2$

$x = 3m^2 + 5\ mn + 4n^2$

So, the number is $3m^2 + 5\ mn + 4n^2$.

32. Volume of cube =$(Side)^3$

Volume of ech small cube = $20^3 = 8000\ cm^3$

$= 0.008\ m^3$

Now, volume of the cubical box = $23 = 8m^3$

∵ Number of small cubes, that can just be accommodated in the cubical box

$= \frac{\text{Volume of cubical box}}{\text{Volume of small cube}} \times \frac{8}{0.008}$

= 1000

33. $\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-2}$

$= \frac{1^{-2}}{2^{-2}} + \frac{1^{-2}}{3^{-2}} + \frac{1^{-2}}{4^{-2}}$

$= \frac{2^2}{1^2} + \frac{3^2}{1^2} + \frac{4^2}{1^2}$

$\frac{4}{1} + \frac{9}{1} + \frac{16}{1}$

= 4 + 9 + 16

= 29

34. 96abc (3a – 12) (5b – 30) ÷ 144 (a – 4) (b – 6)

$= \frac{96abc(3a-12)(5b-30)}{144(a-b)(b-6)}$

$= \frac{96abc \times 3(a-4) \times 5(b-6)}{144(a-4)(b-6)}$

= 10abc

35. It is given that ∠MST = 40°

In ΔMST,

∠TMS + ∠MST + ∠STM = 180° [By the angle sum property of a triangle]

⇒ ∠STM = 180° - (90° + 40°) = 50° [∵ SM⊥ LT, ∠TMS = 90°]

∠SON = ∠STM = 50° [∵ opposite angles of a parallelogram are equal]

Now, in the ΔONS,

∠ONS + ∠OSN + ∠SON - 180° [angle sum property of triangle]

∠OSN = 180° - (90° + 50°)

= 180° - 140° = 40°

Moreover, ∠SON + ∠TSO = 180° [∵ adjacent angles of a parallelogram are supplementary]

⇒ ∠SON + ∠TSM + ∠NSM + ∠OSN = 180°

⇒ 50° + 40° + ∠NSM + 40° = 180°

⇒ 90°+ 40°+ ∠NSM = 180°

⇒ 130° + ∠NSM = 180°

⇒ ∠NSM = 180° - 130° = 50°

OR

It is given that ∠PER = 25°

and ∠PRE = 30°

Also, ∠PEH = 25°

and ∠PRA = 30°[∵EP and PR are angle bisectors of ∠REH, and ∠ARE respectively]

Since, HARE is a trapezium,

Therefore, ∠E + ∠H = 180°[co-interior angles]

⇒∠PER + ∠PEH + ∠H = 180°

$\Rightarrow$ 25° + 25° + ∠H = 180°

$\Rightarrow$ 50°+ ∠H = 180°

$\Rightarrow$ ∠H = 130°

Similarly, ∠R + ∠A = 180°[co-interior angles]

$\Rightarrow$∠ERP + ∠PRA + ∠RAH = 180°

30° + 30° + ∠A = 180°

60°+ ∠A = 180°

∠A = 120°

Therefore, ∠EHA = 130°

and ∠HAR = 120°

36. Total amount = ₹ 108 crore

Item head	**Amount (in ₹ crore)**	**Central angle**
Road	43.2	$\frac{43.2}{108} \times 360^\circ = 144^\circ$
Electricity	16.2	$\frac{16.2}{108} \times 360^\circ = 54^\circ$
Drinking water	27.00	$\frac{27}{108} \times 360^\circ = 90^\circ$
Sewerage	21.6	$\frac{21.6}{108} \times 360^\circ = 72^\circ$

The pie chart is as follows:

37. Let marked price of the garments = ₹ x

Discount% = 12.5%

Discount = 12.5% of x $= \frac{125}{10\times100} \times x = \frac{1}{8} \times x = \frac{x}{8}$

S.P. = M.P. - Discount

$= x - \frac{x}{8} = \frac{8x-x}{8} = \frac{7x}{8}$

C.P. = ₹ 2,100

Gain% = 25%

$S.P. = \frac{100+Profit\%}{100} \times C.P.$

$= \frac{100+25}{100} \times 2100 = \frac{125}{100} \times 2,100 = ₹.2,625$

Therefore, $\frac{7x}{8}$= ₹ 2,625

$x = \frac{2625\times8}{7} = 375 \times 8 = ₹3,000$

Hence, Marked Price of Garments = ₹3,000.

OR

For Fabina

S.I. on ₹ 12500 at 12% p.a. for 3 years

$= \frac{12500\times12\times3}{100}$

= ₹ 4500

For Radha

P = ₹ 12500

R = 10% per annum

n = 3 years

$\therefore A = P\left(1 + \frac{R}{100}\right)^n = 12500\left(1 + \frac{10}{100}\right)^3$

$= 12500\left(1 + \frac{1}{10}\right)^3 = 12500\left(\frac{11}{10}\right)^3$

$= 12500 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10}$

= ₹ 16637.50

∴ C.I. = A – P

= ₹ 16637.50 – ₹ 12500

= ₹ 4137.50

Difference between C.I. and S.I.

= ₹ 4500 – ₹ 4137.50

= ₹ 362.50

Hence, Fabina pays more by ₹ 362.50

38. For a cylindrical container

Diameter of the base = 14 cm

∴ Radius of the base (r) = $\frac{14}{2} cm$

= 7 cm

Height (h) = 20 cm

∴ Curved surface area of the container $= 2\pi rh$

$= 2 \times \frac{22}{7} \times 7 \times 20$

= 880 cm ^{2}

∴ The surface area of the label

$= 880cm2 - 2\left(2 \times \frac{22}{7} \times 7 \times 2\right) cm2$

= 880 cm^2 – 176 cm^2

= 704 cm^2

Hence, the surface area of the label is 704 cm^2.

Or

Diameter of the base = 14 cm

∴ Radius of the base (r) $= \frac{14}{2} cm$

= 7 cm

Height (h) = (20 – 2×2) = 16 cm

surface area of the label $= 2\pi rh$

$= 2 \times \frac{22}{7} \times 7 \times 16$

= 704 cm^2

39. Let the height of the tree be x metres. We can form a table as shown below:

Height of the object (in metres)	14	x
Length of the shadow (in metres)	10	15

Note that more the height of an object, the more would be the length of its shadow.

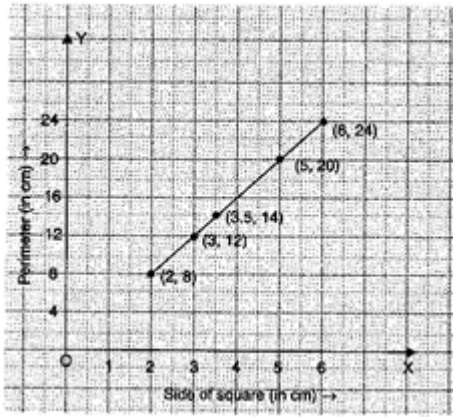
Hence, this is a case of direct proportion.

Thus, $\frac{14}{10} = \frac{x}{15}$

or x = $\frac{14}{10} \times 15$

or x = 21

Thus, height of the tree is 21 m.

40. 

i. Scale :
Horizontal : 1 unit = 1 cm
Vertical : 1 unit = 4 cm

ii. Mark side of the square (in cm) on horizontal axis.

iii. Mark perimeter (in cm) on vertical axis.

iv. Plot the points (2, 8), (3, 12), (3.5, 14), (5, 20) and (6, 24).

v. Join the points.
We get a line graph.