

Class: IX

Instructions :

- Use the first 15 minutes to read the questions and think about the answers.
- There are 26 questions, split into 4 parts A, B, C and D.
- Answer all questions; but in questions of the type A or B, you need answer only one of those.
- You can answer the questions in any order, writing the correct question number.
- No need to simplify irrationals like $\sqrt{2}$, $\sqrt{3}$, π etc. using approximations unless you are asked to do so.
- Answers must be explained, whenever necessary.

Section A

This section has 8 questions of score 1 each. Select the correct answer.

1. What is the length of the side of a square of area 3 square centimetres ?

A. $\sqrt{3}$	B. 3
C. 9	D. 12

2. Find the number which mark the midpoint of the points marked by the pair of numbers -1, 5 on the number line.

A. -2	B. 3
C. 2	D. -3

3. $\left(x + \frac{1}{2}\right)\left(y + \frac{1}{2}\right) = xy + \frac{1}{2}(x + y) + \underline{\hspace{2cm}}$

A. 1	B. $\frac{1}{2}$
C. $\frac{1}{4}$	D. $\frac{1}{8}$

4. The length of an arc of central angle 30° in a circle is 5 centimetres. What is the length of an arc of central angle 120° in the same circle ?

A. 10 centimetres	B. 20 centimetres
C. 30 centimetres	D. 40 centimetres

5. The weights of rubber sheets a farmer got in 5 days in kilograms are given below.
 18, 24, 21, 20, 22
 What is the mean weight ?

A. 20	B. 21
C. 22	D. 23

6. From the following, find the integers x, y satisfying the equation $x^2 + y^2 = 25$.

(i) $x = 0, y = -5$

(ii) $x = -5, y = 5$

(iii) $x = -2, y = -3$

(iv) $x = 4, y = -3$

A. (i) and (iv)

B. (ii) and (iv)

C. (i) and (ii)

D. (ii) and (iii)

7. Read the following statements.

Statement I : The volume of a triangular prism with base area 50 square centimetres and height 8 centimetres is 400 cubic centimetres.

Statement II : The volume of any prism is the product of the base area and height.

Choose the correct answer from the following.

A. Statement I is true, Statement II is false.

B. Statement II is true, Statement I is false

C. Both the statements are true, Statement II is the reason for Statement I.

D. Both the statements are true, Statement II is not the reason for Statement I.

8. Read the following statements.

Statement I : In circles of different radii, the circumference changes proportionally with respect to radius.

Statement II : If the relation between two quantities measured as the numbers x and y is $y = \frac{k}{x}$, (where k is a constant) then the quantity indicated by y changes inversely proportional to the quantity indicated by x .

Choose the correct answer from the following.

A. Statement I is true, Statement II is false.

B. Statement II is true, Statement I is false

C. Both the statements are true, Statement II is the reason for Statement I.

D. Both the statements are true, Statement II is not the reason for Statement I.

Section- B

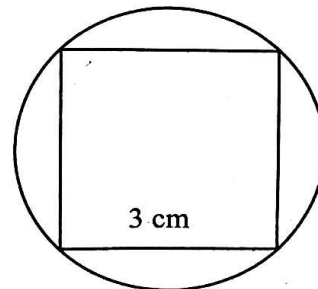
This section contains 6 questions of 3 score each.

9. Draw an equilateral triangle of perimeter 10 centimetres.

10. A. Side of the square in the picture is 3 centimetres.

(i) What is the radius of the circle ?

(ii) Calculate the perimeter of the circle.



OR

B. The length of a chord of a circle, 3 centimetres from the centre is 8 centimetres. What is the area of the circle ?

11. Price of 2 pens and 3 pencils is 39 rupees. Price of 2 pens and 7 pencils is 59 rupees.
- What is the price of a pencil ?
 - What is the price of a pen ?
12. A. (i) In regular polygons, write the relation between the number of sides and the measure of an outer angle as an equation. Identify the type of proportionality.
- Write the proportionality constant.

OR

B. A wheel with radius 50 centimetres is moving in a straight line.

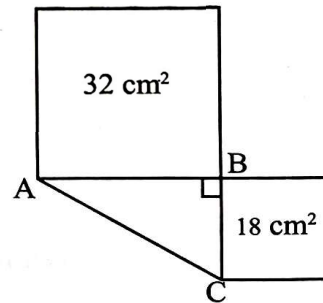
- How much distance is travelled in one rotation ?
 - Is the distance travelled proportional to the number of rotations ? If yes, write the proportionality constant.
13. The base radius of a cylinder is 7 centimetres and its height is 15 centimetres.
- What is the base area of the cylinder ?
 - Find the volume of the cylinder.
14. The length of an arc in a circle of radius 5 centimetres is 6π centimetres. Calculate the central angle of the arc.

Section- C

This section contains 6 questions of 4 score each.

15. Draw the graph of the polynomial $p(x) = 2x + 1$.
16. A. In the figure, ABC is a right triangle. Area of the square with side AB is 32 square centimetres and area of the square with side BC is 18 square centimetres.

- What is the length of AB ?
- Calculate the perimeter of the triangle ABC.



OR

- B. Sides of a triangle are 13 centimetres, 14 centimetres and 15 centimetres.
- What is the perimeter of the triangle ?
 - Find the area of the triangle.

17. The edges of a metallic rectangular prism are 5 centimetres, 8 centimetres and 16 centimetres. It is melted and recast into cubes of side 4 centimetres.

- (i) Calculate the volume of the rectangular prism.
- (ii) What is the volume of a cube ?
- (iii) How many such cubes can be made ?

18. (i) $p(x) = x^2 - 5x + 4$, find $p(0)$, $p(-2)$.

(ii) $p(x) = 3x^2 + 2x + 1$, find $p(1)$, $p(10)$

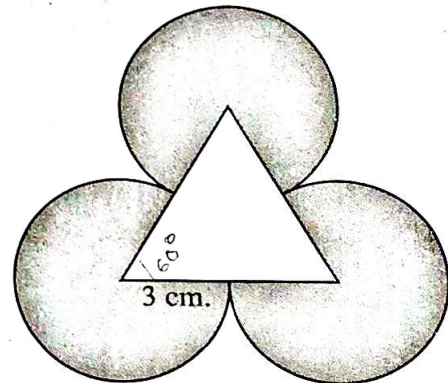
19 The table below shows the children in a class grouped according to their heights.

Height (in centimetres)	Number of children
140	5
142	10
145	8
148	5
150	2

What is the mean height ?

20 A. In the picture, three sectors of same radius are drawn with the vertices of the triangle as centres. Radius of each sector is 3 centimetres.

- (i) What is the central angle of one sector ?
- (ii) Find the area of the shaded part.

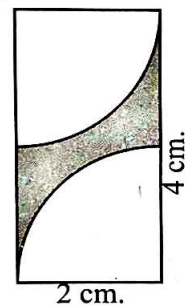


OR

B. In the picture, the sides of the rectangle are 4 centimetres and 2 centimetres.

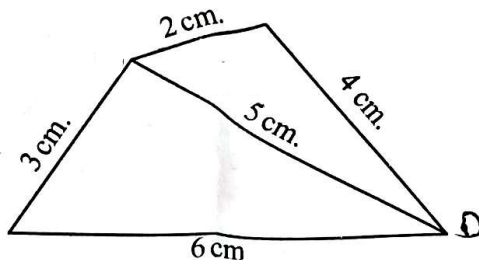
Two sectors of radius 2 centimetres are drawn with the opposite vertices of the rectangle as centres.

- (i) Find the arc length of one sector.
- (ii) Find the perimeter of the shaded figure.

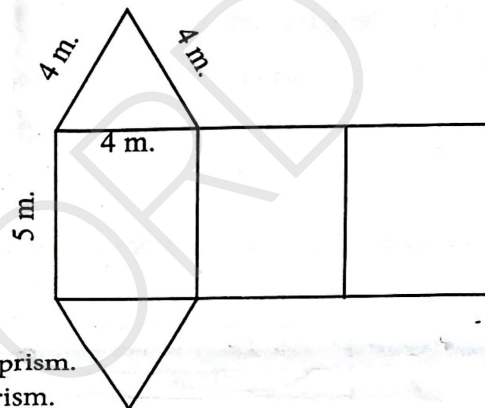


Section- D
This section contains 6 questions of 5 score each.

21. Draw a quadrilateral with the same angles of the given quadrilateral and sides scaled by a factor of $1\frac{1}{2}$.



22. A. A sheet is cut out as shown in the figure. A prism is made using this.



- (i) Write the suitable name for the prism.
- (ii) Calculate the base area of the prism.
- (iii) Calculate the total cost of the sheet used to make the prism at a rate of 80 rupees per square metre.

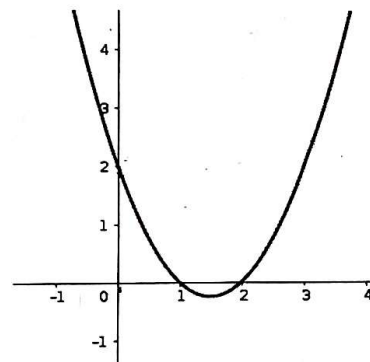
OR

- B. Base perimeter of a cylindrical tank is 120π centimetres and its height is 1.5 metres.

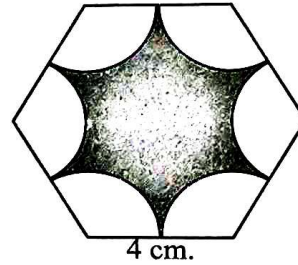
- (i) What is the base radius of the tank ?
- (ii) Find the base area of the tank.
- (iii) How many litres of water does it contain ?

23. The graph of a polynomial $p(x) = ax^2 + bx + c$ is given.

- (i) Write $p(0)$, $p(1)$, $p(2)$.
- (ii) Find the polynomial.



24. A. In the figure, sides of the regular hexagon are 4 centimetres. Arcs of equal length are drawn with the vertices of the hexagon as centres.



- (i) What is the central angle of an arc ?
(ii) What is the perimeter of the shaded picture ?
(iii) Find the area of the shaded part.

OR

- B. A circular ring of perimeter 12π centimetres is divided into three equal arcs.

- (i) Find the length of an arc.
(ii) If one of these arcs is bent into a circle, then what is the radius of the circle ?
(iii) Calculate the area of this circle upto two decimal places.

- 25) The table shows number of workers of different category in a company grouped according to their daily wages.

Daily wages (in Rs.)	Number of workers
550 - 650	10
650 - 750	13
750 - 850	9
850 - 950	11
950 - 1050	7

- (i) What is the total number of workers ?
(ii) Calculate the mean daily wage.

- 26/ A. The table shows the radius and arc length of sectors of central angle 60° .

radius	arc length
$r = 1$	$1 \times \frac{\pi}{3}$
$r = 2$	$2 \times \frac{\pi}{3}$
$r = 3$	$3 \times \frac{\pi}{3}$
$r = 4$	_____
$r = 10$	_____

- Complete the given table.
- What is the length of the arc when the radius is x ?
- Is arc length proportional to radius ? If yes, write the constant of proportionality.

OR

- B. Consider an object moving in a straight line from one point to another point which is at a distance of 100 metres away.

speed (m/sec)	time (sec)
10	$\frac{100}{10} = 10$
20	_____ (a)
50	_____ (b)

- Complete the table.
- By taking speed as x m/sec. and time as y seconds, write the relation between x and y as an equation.
- How do we state this relation in terms of proportion ?
- Write the proportionality constant.