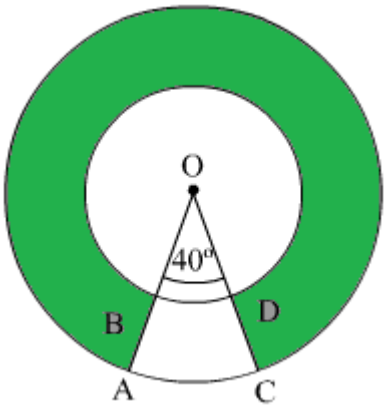
Case Based Questions

Q.No.1:
Attempt any 4 sub parts of the following case-based question. Each sub part carries 1 mark.
A secondary school in Adarsh Nagar is building a playground having a grassy lawn boundary. Students of class X has been allotted an area for growing grass as a part of their gardening activity. Given below is the architectural drawing map of the playground where the shaded region enclosed between the two concentric circles of radii, 7 cm and 14 cm is the grassy lawn.

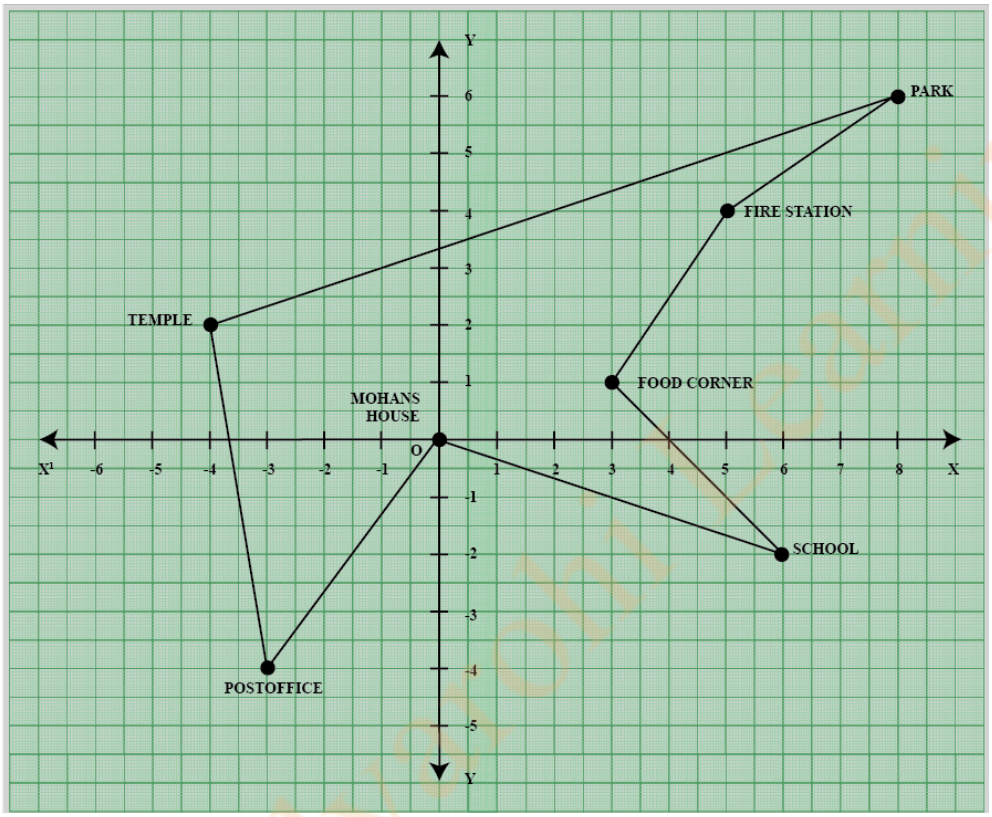


(i) The area of the region ABDC is given by
a) Area of sector AOC + Area of sector BOD b) Area of sector AOC − Area of sector BOD
c) Area of sector AOC ÷ Area of sector BOD d) Area of sector AOC × Area of sector BOD
(ii) Write the formula for finding the area of the sector if the degree measure of the angle at the centre of the circle (of radius 'r') is 'θ'.
a) $\frac{\theta}{180^\circ} \times 2\pi r$

b) $\frac{\theta}{360^\circ} \times \pi r^2$ c) $\frac{\theta}{\pi r^2} \times 360^\circ$ d) $\frac{\theta}{2\pi r} \times 360^\circ$
(iii) Find the area of the sector AOC.
a) 34.22 cm^2 b) 51.33 cm^2 c) 68.44 cm^2 d) 79.88 cm^2
(iv) Find the area of the circular ring.
a) 154 cm^2 b) 350 cm^2 c) 462 cm^2 d) 616 cm^2
(v) Find the length of the arc AC.
a) 8.82 cm b) 9.78 cm c) 68.44 cm d) 78.84 cm

Q.No.2: Attempt any 4 sub parts of the following case based question. Each sub part carries 1 mark.

Mohan studies in grade X. Next week he is giving birthday party to a few of his class fellows at his home. He explained the way to his home to everyone by making the map of his locality on a coordinate plane as shown below. Look at the map and answer the following questions.



(i) If Mohan's house is located at the origin, then what are the coordinates of the post office?

(a) (−3, −4) (b) (−3, 4) (c) (−4, −3) (d) (−4, 3)

(ii) There is a food market at a distance of $2\sqrt{10}$ units from Mohan's house. If its abscissa is −6, then its ordinate is

(a) ±1 (b) ±2 (c) ±3 (d) ±4

(iii) What are the coordinates of the point on the *x*-axis which is equidistant from the post office and school?

(a) $\left(\frac{4}{3}, 0\right)$ (b) $\left(-\frac{4}{3}, 0\right)$ (c) $\left(\frac{5}{6}, 0\right)$ (d) $\left(-\frac{5}{6}, 0\right)$

(iv) What are the coordinates of the point which divides the line segment joining the temple and park in the ratio 3 : 1 internally?

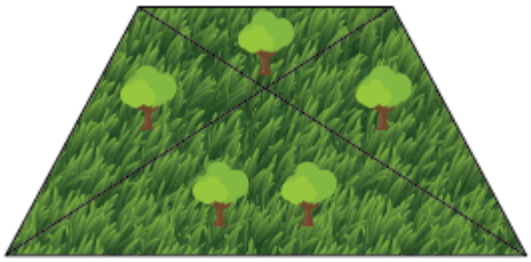
(a) (5, 5) (b) (2, 4) (c) $\left(4, \frac{9}{2}\right)$ (d) (−1, 3)

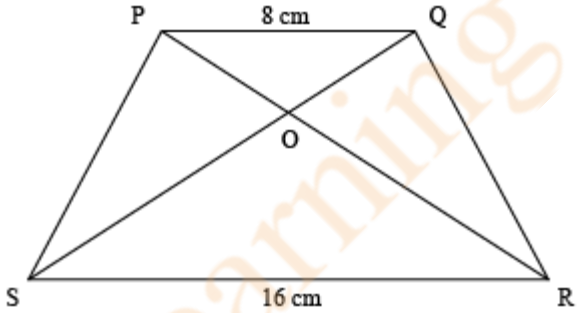
(v) Let P be a point on the coordinate plane. If the line segments joining the

coordinates of fire station, food corner, school and point P forms a parallelogram, then what are the coordinates of P?
(a) (7, 1) (b) (7, 2) (c) (8, 1) (d) (8, 2)

Q.No.3: Attempt any 4 sub parts of the following case-based question. Each sub part carries 1 mark.

A farmer has a field in the shape of a trapezium. He has four children. He divided the field into four parts by joining the opposite vertices of the trapezium and distributed it among his children. The map of the field is shown below (Scale: 1 cm = 50 m).





(a) The triangular region POQ is similar to the triangular region ROS by
(i) SAS similarity criterion (ii) SSS similarity criterion (iii) AA similarity criterion (iv) RHS similarity criterion

(b) The farmer divides the triangular region POQ into two parts by drawing a line parallel to PQ which intersects OP in X and OQ in Y. If OX = 2.4 cm, XP = 3.6 cm and OY = 3 cm, then what is the value of YQ?
(i) 3.5 cm (ii) 3.8 cm (iii) 4.5 cm (iv) 4.8 cm

(c) What is the ratio of perimeter of ΔPOQ to perimeter of ΔROS?
(i) 1 : 2 (ii) 2 : 1 (iii) 1 : 3 (iv) 3 : 1

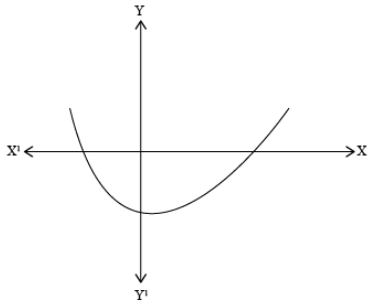
(d) If OS = $(2x + 4)$ cm, OR = $(4x - 2)$ cm, OQ = $(x + 1)$ cm and OP = 4 cm, then what is the value of x?
(i) 2 (ii) 3 (iii) 4 (iv) 5

(e) In ΔROS, OT is the bisector of ∠ROS meeting the side SR in T. If OR = 7.2 cm and TR = 6 cm, then what is the value of OS?
(i) 8 cm (ii) 9 cm (iii) 12 cm (iv) 14 cm

Q.No.4: Attempt any 4 sub parts of the following case-based question. Each sub part carries 1 mark.

Rahul loves to decorate his home in different ways every year, especially on Diwali. This year also he decorated the door of his house with beautiful garlands as shown below. Visualize the shape of the garland in the 2D plane and answer

the questions from (i) to (v).



(a) What is the shape formed by the garland?
(i) Spiral (ii) Ellipse (iii) Hyperbola (iv) Parabola

(b) If the curve represented by the garland is $y = x^2 + 2x - 15$, then its zeroes are
(i) 3, −5 (ii) −3, 5 (iii) −3, −5
(iv) 3, 5

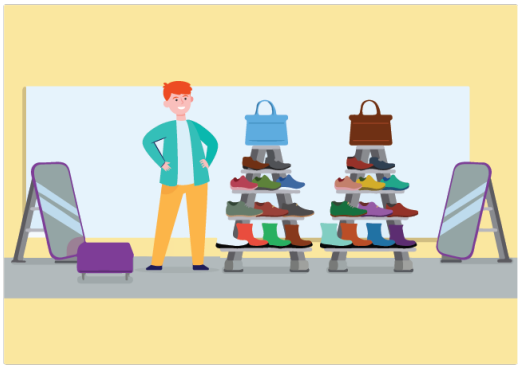
(c) What is the number of zeroes of the polynomial represented by the garland curve?
(i) One (ii) Two (iii) At least two (iv) At most two

(d) If the sum and product of zeroes of the polynomial represented by the garland curve are 7 and −18, then what is the polynomial represented by the curve?
(i) $x^2 - 7x - 18$ (ii) $x^2 + 7x - 18$ (iii) $x^2 - 7x + 18$
(iv) $x^2 + 7x + 18$

(e) What is the quadratic polynomial whose one root is −1 and product of roots is $\frac{2}{3}$?
(i) $3x^2 + 5x + 2$ (ii) $3x^2 - 5x + 2$ (iii) $3x^2 + 5x - 2$
(iv) $3x^2 - 5x - 2$

Q.No.5: Attempt any 4 sub parts of the following case-based question. Each sub part carries 1 mark.

Rohan studies in grade X. His father is a shopkeeper and use to analyse monthly sales of the pair of shoes once a month. Rohan recently studied the 'statistics' chapter in his school. So, this month he also helped his father in analysing the pattern of the monthly sales. For this, he recorded the number of pair of shoes sold by his father. Observe the table given below and answer the questions from (i) to (v).



Number of Pair of Shoes Sold	10–15	15–20	20–25	25–30	30–35
Number of Days	6	9	7	3	5

(a) What is the modal class for the given data?
(i) 10–15 (ii) 15–20 (iii) 20–25
(iv) 30–35
(b) What is the mode of the given data?
(i) 16 (ii) 17 (iii) 18
(iv) 19
(c) What is the upper limit of the median class?
(i) 20 (ii) 25 (iii) 30
(iv) 35
(d) What is the median of the given data?
(i) 16 (ii) 18 (iii) 20
(iv) 22
(e) What is the mean number of pair of shoes sold by him?
(i) 18 (ii) 19 (iii) 20
(iv) 21