

Followings are of 2 Marks each (Q01-05).

- Q01. Find the radius of circle $3x^2 + 3y^2 + 6x - 4y - 1 = 0$, also write the coordinates of its center.
- Q02. Find the equation of a parabola whose vertex is at the origin (0, 0), the axis along the x-axis and which passes through the point (2, 3).
- Q03. For the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$, determine the coordinates of foci and the length of latus-rectum.
- Q04. Check whether the radii of the circles $x^2 + y^2 = 1$, $x^2 + y^2 - 2x - 6y - 6 = 0$ and $x^2 + y^2 - 4x - 12y - 9 = 0$ are in arithmetic progression or not.
- Q05. For the conic $4x^2 + y^2 = 1$, write the coordinates of vertices, the length of major axis and the length of minor axis. [2 × 5 = 10]

Followings are of 3 Marks each (Q06-07).

- Q06. For $y^2 - 16x^2 = 1$, obtain foci, vertices, length of latus rectum and equation of directrices.
- Q07. Determine the equation of an ellipse whose eccentricity is $\frac{4}{5}$ and whose foci coincide with those of the hyperbola $9x^2 - 16y^2 + 144 = 0$.

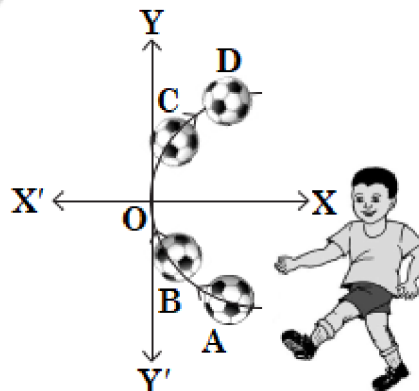
OR

Find the equation of a circle whose centre lies on the line $x - 4y - 1 = 0$ and which passes through the points (3, 7) and (5, 5). [3 × 2 = 6]

Following is of 4 Marks (Q08).

- Q08. **CASE STUDY** : Surya was playing a football match. When he kicked the football, the path formed by the football from the ground level is parabolic, which is shown in the figure given below.

Assume that the coordinates of A as (3, -2).



Based on the above information, answer the following questions.

- (a) Determine the equation of path formed by football when it was kicked by Surya.
- (b) Write the length of latus-rectum of the equation obtained in (a).
- (c) Write the extremities of latus-rectum for the equation obtained in (a).
- (d) Write the equation of directrix of the path formed by the football. [1 × 4 = 4]

Followings are of 5 Marks each (Q09-10).

- Q09. Find the value of eccentricity (e) of an ellipse if the distance between its foci is same as the length of its latus-rectum.

OR

Find the equation of an ellipse whose major axis lies on the x-axis and which passes through the points (4, 3) and (6, 2).

- Q10. The focus of a parabolic mirror is at a distance of 5 cm from its vertex and the mirror is 15 cm deep.
Find the length of the diameter of mirror. $[5 \times 2 = 10]$

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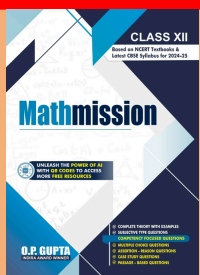
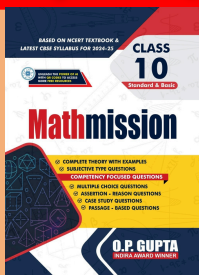
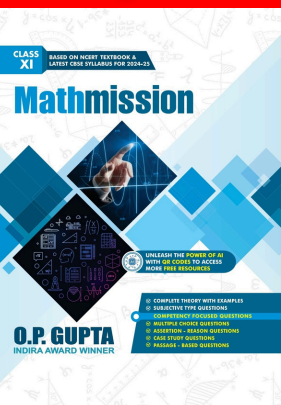
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