# MATHS

# BOOKS - RS AGGARWAL MATHS (HINGLISH)

# ELLIPSE

## Solved Examples

**1.** Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the

eccentricity and the length of the latus rectum of the ellipse. $\frac{x^2}{16} + \frac{y^2}{9} = 1$

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**2.** Find the lengths of the major and minor axes, coordinates of the vertices and the foci, the eccentricity and length of the latus rectum of the ellipse:

$4x^2 + 9y^2 = 144.$

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**3.** Find the lengths of the major and minor axes, coordinates of the vertices and the foci, the eccentricity and length of the latus rectum of the ellipse:

$$\frac{x^2}{4} + \frac{y^2}{36} = 1.$$

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**4.** Find the lengths of the major and minor axes, coordinates of the vertices and the foci, the eccentricity and length of the latus rectum

of the ellipse:

$4x^2 + y^2 = 100.$

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**5.** Find the equation if the ellipse whose axes are along the coordinate axes, vertices are $(\pm 5, 0)$ and foci at $(\pm 4, -0)$.

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**6.** Find the equation of the ellipse whose foci are $(\pm 4, 0)$ and eccentricity is $\frac{1}{3}$.

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**7.** Find the equation for the ellipse that satisfies the given conditions: Major axis on the xaxis and passes through the points (4, 3) and (6, 2).

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**8.** Find the equation for the ellipse that satisfies the given conditions:Ends of major axis $(\pm 3, 0)$, ends of minor axis $(0, \pm 2)$

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**9.** Find the equation of an ellipse whose eccentricity is 2/3, the latus rectum is 5 and the centre is at the origin.

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**10.** Find the equation of ellipse whose vertices are $(0, \pm 13)$ and foci $(0, \pm 5)$.

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**11.** Find the equation of the ellipse in the following case: Length of minor axis 16 foci $(0, \pm 6)$

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**12.** Find the equation of the ellipse, whose length of the major axis is 20 and foci are $(0, \pm 5)$.

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**13.** Find the equation of an ellipse whose vertices are $(0, \pm 10)$ and eccentricity $e = \frac{4}{5}$

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**14.** Find the equation of ellipse, Centre at (0,0), major axis on the y-axis and passes through the points (3,2) and (1,6).

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## Exercise

**1.** Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the

eccentricity and the latus rectum of the ellipse

$$\frac{x^2}{25} + \frac{y^2}{9} = 1$$

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**2.** Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse. $\frac{x^2}{49} + \frac{y^2}{36} = 1$

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**3.** Find the (i) lengths of major and minor axes, (ii) coordinates of the vertices, (iii) coordinates of the foci, (iv) eccentricity, and (v) length of the latus rectum of each of the following ellipses.

$16x^2 + 25y^2 = 400$

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**4.** Find the (i) lengths of major and minor axes, (ii) coordinates of the vertices, (iii) coordinates

of the foci, (iv) eccentricity, and (v) length of the latus rectum of each of the following ellipses.

$x^2 + 4y^2 = 100$

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**5.** Find the (i) lengths of major and minor axes, (ii) coordinates of the vertices, (iii) coordinates of the foci, (iv) eccentricity, and (v) length of the latus rectum of each of the following

ellipses.

$9x^2 + 16y^2 = 144$

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**6.** Find the eccentricity coordinates of foci length of the latus rectum of the following ellipse: $4x^2 = 9y^2 = 1$

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**7.** Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse. $\frac{x^2}{4} + \frac{y^2}{25} = 1$

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**8.** Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse. $\frac{x^2}{16} + \frac{y^2}{9} = 1$

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**9.** Find the (i) lengths of major and minor axes, (ii) coordinates of the vertices, (iii) coordinates of the foci, (iv) eccentricity, and (v) length of the latus rectum of each of the following ellipses.

$3x^2 + 2y^2 = 18$

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**10.** Find the coordinates of the foci, the vertices, the lengths of major and minor axes and the eccentricity of the ellipse $9x^2 + 4y^2 = 36$.

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**11.** Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.$16x^2 + y^2 = 16$

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**12.** Find the (i) lengths of major and minor axes, (ii) coordinates of the vertices, (iii) coordinates of the foci, (iv) eccentricity, and (v) length of the latus rectum of each of the following ellipses.

$25x^2 + 4y^2 = 100$

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**13.** Find the equation of the ellipse whose vertices are $(\pm 6, 0)$ and foci are $(\pm 4, 0)$.

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**14.** Find the equation of the ellipse whose vertices are at $(0, \pm 4)$ and foci at $(0, \pm \sqrt{7})$.

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**15.** Find the equation of the ellipse the ends of whose major and minor axes are $(\pm 4, 0)$ and $(0, \pm 3)$ respectively.

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**16.** The length of the major axis of an ellipse is 20 units and its foci are $\left(\pm 5\sqrt{3}, 0\right)$.

Find the equation of the ellipse.

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**17.** Find the equation of the ellipse whose foci are $(\pm 2, 0)$ and eccentricity is $\frac{1}{3}$.

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**18.** Find the equation of the ellipse whose foci are at $(\pm 1, 0)$ and $e = \frac{1}{2}$.

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**19.** Find the equation of the ellipse whose axes are along the coordinate axes, foci at $(0, \pm 4)$ and eccentricity 4/5.

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**20.** Find the equation of the ellipse, with major axis along the x-axis and passing through the points $(4, 3)$and $(-1, 4)$.

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**21.** Find the equation of the ellipse with eccentricity $\frac{3}{4}$, foci on the y-axis, centre at the origin and passing through the point (6, 4).

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**22.** Find the equation of an ellipse whose foci are at $(\pm 3, 0)$ and which passes through (4,1).

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**23.** Find the equation of an ellipse, the lengths of whose major and minor axes are 10 and 8 units respectively.

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**24.** Find the equation of an ellipse whose eccentricity is 2/3, the latus rectum is 5 and the centre is at the origin.

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**25.** Find the eccentricity of the ellipse whose

(i) latus rectum is half of minor axis

(ii) minor axis is half of major axis.

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**26.** Find the eccentricity of an ellipse whose latus rectum in one half of its major axis.

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