

JEE MATHEMATICS

Topic: Ellipse

Q.1 The equation to the ellipse (referred to its axes as the axes of x and y respectively) whose foci are $(\pm 2, 0)$ and eccentricity $1/2$, is-

(A) $\frac{x^2}{12} + \frac{y^2}{16} = 1$ (B) $\frac{x^2}{16} + \frac{y^2}{12} = 1$

(C) $\frac{x^2}{16} + \frac{y^2}{8} = 1$ (D) None of these

Q.2 The eccentricity of the ellipse

$9x^2 + 5y^2 - 30y = 0$ is-

(A) $1/3$ (B) $2/3$

(C) $3/4$ (D) None of these

Q.3 If the latus rectum of an ellipse be equal to half of its minor axis, then its eccentricity is-

(A) $3/2$ (B) $\sqrt{3}/2$

(C) $2/3$ (D) $\sqrt{2}/3$

Q.4 If distance between the directrices be thrice the distance between the foci, then eccentricity of ellipse is-

(A) $1/2$ (B) $2/3$

(C) $1/\sqrt{3}$ (D) $4/5$

- Q.5** The equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents an ellipse if-
- (A) $\Delta = 0, h^2 < ab$ (B) $\Delta \neq 0, h^2 < ab$
 (C) $\Delta \neq 0, h^2 > ab$ (D) $\Delta \neq 0, h^2 = ab$
- Q.6** Equation of the ellipse whose focus is $(6, 7)$ directrix is $x + y + 2 = 0$ and $e = 1/\sqrt{3}$ is-
- (A) $5x^2 + 2xy + 5y^2 - 76x - 88y + 506 = 0$
 (B) $5x^2 - 2xy + 5y^2 - 76x - 88y + 506 = 0$
 (C) $5x^2 - 2xy + 5y^2 + 76x + 88y - 506 = 0$
 (D) None of these
- Q.7** The eccentricity of an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ whose latus rectum is half of its major axis is-
- (A) $\frac{1}{\sqrt{2}}$ (B) $\sqrt{\frac{2}{3}}$
 (C) $\frac{\sqrt{3}}{2}$ (D) None of these
- Q.8** The equation of the ellipse whose centre is at origin and which passes through the points $(-3, 1)$ and $(2, -2)$ is-
- (A) $5x^2 + 3y^2 = 32$ (B) $3x^2 + 5y^2 = 32$
 (C) $5x^2 - 3y^2 = 32$ (D) $3x^2 + 5y^2 + 32 = 0$
- Q.9** The equation of the ellipse (referred to its axes as the axes of x and y respectively) which passes through the point $(-3, 1)$ and has eccentricity $\sqrt{\frac{2}{5}}$, is-
- (A) $3x^2 + 6y^2 = 33$ (B) $5x^2 + 3y^2 = 48$
 (C) $3x^2 + 5y^2 - 32 = 0$ (D) None of these

Q.10 Latus rectum of ellipse

$$4x^2 + 9y^2 - 8x - 36y + 4 = 0 \text{ is-}$$

- (A) $\frac{8}{3}$ (B) $\frac{4}{3}$
(C) $\frac{\sqrt{5}}{3}$ (D) $\frac{16}{3}$

Q.11 The latus rectum of an ellipse is 10 and the minor axis is equal to the distance between the foci. The equation of the ellipse is-

- (A) $x^2 + 2y^2 = 100$ (B) $x^2 + \sqrt{2}y^2 = 10$
(C) $x^2 - 2y^2 = 100$ (D) None of these

Q.12 If the distance between the foci of an ellipse be equal to its minor axis, then its eccentricity is-

- (A) $\frac{1}{2}$ (B) $\frac{1}{\sqrt{2}}$
(C) $\frac{1}{3}$ (D) $\frac{1}{\sqrt{3}}$

Q.13 The equation $2x^2 + 3y^2 = 30$ represents-

- (A) A circle (B) An ellipse
(C) A hyperbola (D) A parabola

Q.14 The equation of the ellipse whose centre is $(2, -3)$, one of the foci is $(3, -3)$ and the corresponding vertex is $(4, -3)$ is-

- (A) $\frac{(x-2)^2}{3} + \frac{(y+3)^2}{4} = 1$ (B) $\frac{(x-2)^2}{4} + \frac{(y+3)^2}{3} = 1$
(C) $\frac{x^2}{3} + \frac{y^2}{4} = 1$ (D) None of these

Q.15 Eccentricity of the ellipse

$$4x^2 + y^2 - 8x + 2y + 1 = 0 \text{ is-}$$

- (A) $\frac{1}{\sqrt{3}}$ (B) $\frac{\sqrt{3}}{2}$
(C) $\frac{1}{2}$ (D) None of these

Q.16 The equation of ellipse whose distance between the foci is equal to 8 and distance between the directrix is 18, is-

(A) $5x^2 - 9y^2 = 180$ (B) $9x^2 + 5y^2 = 180$

(C) $x^2 + 9y^2 = 180$ (D) $5x^2 + 9y^2 = 180$

Q.17 In an ellipse the distance between its foci is 6 and its minor axis is 8. Then its eccentricity is-

(A) $\frac{4}{5}$ (B) $\frac{1}{\sqrt{52}}$

(C) $\frac{3}{5}$ (D) $\frac{1}{2}$

Q.18 The eccentricity of an ellipse is $2/3$, latus rectum is 5 and centre is $(0, 0)$. The equation of the ellipse is-

(A) $\frac{x^2}{81} + \frac{y^2}{45} = 1$ (B) $\frac{4x^2}{81} + \frac{4y^2}{45} = 1$

(C) $\frac{x^2}{9} + \frac{y^2}{5} = 1$ (D) $\frac{x^2}{81} + \frac{y^2}{45} = 5$

Q.19 The length of the latus rectum of the ellipse $\frac{x^2}{36} + \frac{y^2}{49} = 1$ is -

(A) $98/6$ (B) $72/7$

(C) $72/14$ (D) $98/12$

Q.20 For the ellipse $\frac{x^2}{64} + \frac{y^2}{28} = 1$, the eccentricity is

(A) $\frac{3}{4}$ (B) $\frac{4}{3}$

(C) $\frac{2}{\sqrt{7}}$ (D) $\frac{1}{3}$

Q.21 The equation of the ellipse whose one of the vertices is (0, 7) and the corresponding directrix is $y = 12$, is-

(A) $95x^2 + 144y^2 = 4655$

(B) $144x^2 + 95y^2 = 4655$

(C) $95x^2 + 144y^2 = 13680$

(D) None of these

Q.22 The foci of the ellipse,

$25(x + 1)^2 + 9(y + 2)^2 = 225$, are at-

(A) (-1, 2) and (-1, -6)

(B) (-2, 1) and (-2, 6)

(C) (-1, -2) and (-2, -1)

(D) (-1, -2) and (-1, -6)

Q.23 The eccentricity of the ellipse represented by the equation $25x^2 + 16y^2 - 150x - 175 = 0$ is -

(A) $2/5$

(B) $3/5$

(C) $4/5$

(D) None of these

Q.24 The equation of the ellipse whose foci are $(\pm 5, 0)$ and one of its directrix is $5x = 36$, is -

(A) $\frac{x^2}{36} + \frac{y^2}{11} = 1$

(B) $\frac{x^2}{6} + \frac{y^2}{\sqrt{11}} = 1$

(C) $\frac{x^2}{6} + \frac{y^2}{11} = 1$

(D) None of these

Q.25 If S and S' are two foci of an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ ($a < b$) and P (x_1, y_1) a point on it, then SP + S'P is equal to-

(A) 2a

(B) 2b

(C) $a + ex_1$

(D) $b + ey_1$

- Q.26** Let P be a variable point on the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$ with foci S and S'. If A be the area of triangle PSS', then maximum value of A is—
- (A) 12 sq. units (B) 24 sq. units
(C) 36 sq. units (D) 48 sq. units
- Q.27** The parametric representation of a point on the ellipse whose foci are $(-1, 0)$ and $(7, 0)$ and eccentricity $1/2$ is—
- (A) $(3 + 8 \cos \theta, 4\sqrt{3} \sin \theta)$
(B) $(8 \cos \theta, 4\sqrt{3} \sin \theta)$
(C) $(3 + 4\sqrt{3} \cos \theta, 8 \sin \theta)$
(D) None of these
- Q.28** The position of the point $(4, -3)$ with respect to the ellipse $2x^2 + 5y^2 = 20$ is—
- (A) outside the ellipse
(B) on the ellipse
(C) on the major axis
(D) None of these
- Q.29** If $\frac{x}{a} + \frac{y}{b} = \sqrt{2}$ touches the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, then its eccentric angle θ is equal to—
- (A) 0 (B) 90°
(C) 45° (D) 60°
- Q.30** Find the equation of the tangent to the ellipse $x^2 + 2y^2 = 4$ at the points where ordinate is 1.
- (A) $x + \sqrt{2}y - 2\sqrt{2} = 0$ & $x - \sqrt{2}y + 2\sqrt{2} = 0$
(B) $x - \sqrt{2}y - 2\sqrt{2} = 0$ & $x - \sqrt{2}y + 2\sqrt{2} = 0$
(C) $x + \sqrt{2}y + 2\sqrt{2} = 0$ & $x + \sqrt{2}y + 2\sqrt{2} = 0$
(D) None of these

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	B	B	B	C	B	B	A	B	C	A
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	A	B	B	B	B	D	C	B	B	A
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	B	A	B	A	B	A	A	A	C	A