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Ellipse and Hyperbola

- The eccentricity of the ellipse $25x^2 + 16y^2 = 400$ is
 (A) $\frac{3}{5}$ (B) $\frac{1}{3}$
 (C) $\frac{2}{5}$ (D) $\frac{1}{5}$
- The sum of focal distance of any point on the ellipse with major and minor axes as $2a$ and $2b$ respectively is equal to
 (A) $2a$ (B) $2\frac{a}{b}$
 (C) $2\frac{b}{a}$ (D) $\frac{b^2}{a}$
- The eccentricity of the conic $4x^2 + 16y^2 - 24x - 32y = 1$ is
 (A) $\frac{1}{2}$ (B) $\sqrt{3}$
 (C) $\frac{\sqrt{3}}{2}$ (D) $\frac{\sqrt{3}}{4}$
- Equation of the ellipse with eccentricity $\frac{1}{2}$ and foci at $(\pm 1, 0)$ is
 (A) $\frac{x^2}{3} + \frac{y^2}{4} = 1$ (B) $\frac{x^2}{4} + \frac{y^2}{3} = 1$
 (C) $\frac{x^2}{4} + \frac{y^2}{5} = \frac{4}{3}$ (D) None of these
- The distance between the foci of an ellipse is 16 and eccentricity is $\frac{1}{2}$ length of the major axis of the ellipse is
 (A) 8 (B) 64
 (C) 16 (D) 32
- If the latusrectum of an ellipse is equal to half its minor axis, then what is its eccentricity?
 (A) $\frac{1}{2}$ (B) $\sqrt{3}$
 (C) $\frac{\sqrt{3}}{2}$ (D) $\frac{1}{\sqrt{2}}$
- In an ellipse $9x^2 + 5y^2 = 45$, the distance between the foci is
 (A) $4\sqrt{5}$ (B) $3\sqrt{5}$
 (C) 3 (D) 4
- What is the eccentricity of an ellipse, if its latusrectum is equal to one-half of its minor axis?
 (A) $\frac{1}{4}$ (B) $\frac{1}{2}$
 (C) $\frac{\sqrt{3}}{4}$ (D) $\frac{\sqrt{3}}{2}$
- The eccentricity of the ellipse $25x^2 + 16y^2 - 150x - 175 = 0$ is
 (A) $\frac{2}{5}$ (B) $\frac{2}{3}$
 (C) $\frac{4}{5}$ (D) $\frac{3}{5}$
- The equation of the ellipse with foci at $(\pm 5, 0)$ and $x = \frac{36}{5}$ as one directrix, is
 (A) $\frac{x^2}{3} + \frac{y^2}{5} = 1$ (B) $\frac{x^2}{36} + \frac{y^2}{11} = 1$
 (C) $\frac{x^2}{36} + \frac{y^2}{9} = 1$ (D) $\frac{x^2}{11} + \frac{y^2}{36} = 1$

11. In how many points do the ellipse $\frac{x^2}{4} + \frac{y^2}{8} = 1$ and the circle $x^2 + y^2 = 9$ intersect?
 (A) one (B) two
 (C) four (D) none of these

Directions (12-15) Consider the equation of ellipse $12x^2 + 4y^2 + 24x - 16y + 25 = 0$

12. The centre of the ellipse is
 (A) (4, -1) (B) (2, 1)
 (C) (-1, 2) (D) (-3, 2)
13. The length of major and minor axes are
 (A) (2, 4) (B) $\sqrt{3}, 1$
 (C) $2, 2\sqrt{3}$ (D) 4, 6
14. The eccentricity of the ellipse is
 (A) $\sqrt{\frac{1}{3}}$ (B) $\frac{3}{4}$
 (C) $\sqrt{\frac{2}{3}}$ (D) $\frac{1}{4}$
15. Coordinates of the foci are
 (A) $\left(0, 1 \pm \frac{1}{\sqrt{3}}\right)$ (B) $\left(0, 2 \pm \sqrt{\frac{1}{3}}\right)$
 (C) $\left(1, 2 \pm \frac{1}{\sqrt{2}}\right)$ (D) $\left(-1, 2 \pm \frac{1}{\sqrt{2}}\right)$
16. If e_1, e_2 , be the eccentricities of ellipse $9x^2 + 4y^2 = 36$ and the hyperbola $9x^2 + 4y^2 = 36$ respectively then
 (A) $e_1^2 + e_2^2 > 3$ (B) $e_1^2 + e_2^2 = 2$
 (C) $e_1^2 + e_2^2 > 4$ (D) $e_1^2 + e_2^2 < 3$
17. The eccentricity of the hyperbola with latusrectum 12 and semi-conjugate axis $2\sqrt{3}$ is
 (A) 2 (B) 3
 (C) $\frac{\sqrt{3}}{2}$ (D) $2\sqrt{3}$
18. If e and e' be the eccentricities of a hyperbola and its conjugate, then $\frac{1}{e^2} + \frac{1}{e'^2}$ is equal to
 (A) 0 (B) 1
 (C) 2 (D) -1

19. Equation of the hyperbola with eccentricity $\frac{3}{2}$ and foci at $(\pm 2, 0)$ is $5x^2 - 4y^2 = k^2$. What is the value of k ?

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

20. The foci of the hyperbola $4x^2 - 9y^2 - 1 = 0$ are

- (A) $(\pm\sqrt{13}, 0)$ (B) $\left(\pm\frac{\sqrt{3}}{6}, 0\right)$
 (C) $\left(0 \pm \frac{\sqrt{13}}{6}\right)$ (D) None of these

21. The eccentricity of the hyperbola $16x^2 - 9y^2 = 1$, is

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

22. The foci of the hyperbola $2x^2 - 3y^2 = 5$ is

- (A) $\left(\pm\frac{5}{\sqrt{6}}, 0\right)$ (B) $\left(\pm\frac{5}{6}, 0\right)$
 (C) $\left(\pm\frac{\sqrt{5}}{6}, 0\right)$ (D) None of these

23. The length of latusrectum of the hyperbola. $16x^2 - 9y^2 = 144$ is

- (A) $\frac{16}{3}$ (B) $\frac{32}{3}$
 (C) $\frac{8}{3}$ (D) $\frac{4}{3}$

24. The distance between the directrices of rectangular hyperbola is 10 units, then distance its foci is

- (A) $10\sqrt{2}$ (B) 5
 (C) $5\sqrt{2}$ (D) 20

25. Locus of the point of intersection of straight lines $\frac{x}{a} - \frac{y}{b} = m$ and $\frac{x}{a} + \frac{y}{b} = \frac{1}{m}$ is
- (A) an ellipse
 (B) a circle
 (C) a hyperbola
 (D) a parabola
26. The length of transverse axis of the hyperbola $3x^2 + 4y^2 = 32$ is
- (A) $\frac{8\sqrt{2}}{\sqrt{3}}$ (B) $\frac{16\sqrt{2}}{\sqrt{3}}$
 (C) $\frac{3}{32}$ (D) $\frac{64}{3}$
27. The eccentricity of the hyperbola $25x^2 - 9y^2 = 144$ is
- (A) $\frac{\sqrt{34}}{12}$ (B) $\frac{\sqrt{34}}{3}$
 (C) $\frac{6}{\sqrt{34}}$ (D) $\frac{3}{\sqrt{34}}$
28. Equation of the hyperbola with eccentricity $\frac{3}{2}$ and foci at $(\pm 2, 0)$ is $5x^2 - 4y^2 = k^2$ what is the value of k ?
- (A) $\frac{4}{3}$ (B) $\frac{3}{4}$
 (C) $\left(\frac{4}{3}\right)\sqrt{3}$ (D) $\left(\frac{3}{4}\right)\sqrt{5}$
29. The standard equation of the hyperbola having the distance between foci as 32 and eccentricity $2\sqrt{2}$ is
- (A) $7x^2 - y^2 = 56$ (B) $x^2 - 7y^2 = 56$
 (C) $7x^2 - y^2 = 224$ (D) $x^2 - 7y^2 = 224$
30. The equation of the hyperbola whose eccentricity is $\frac{5}{4}$ and distance between foci is 10 is given by
- (A) $\frac{x^2}{25} - \frac{y^2}{16} = 1$ (B) $\frac{x^2}{16} - \frac{y^2}{9} = 1$
 (C) $\frac{x^2}{9} - \frac{y^2}{16} = 1$ (D) $\frac{x^2}{16} - \frac{y^2}{25} = 1$