



MATHS

BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

Hyperbola

Examples

1. The equation of the hyperbola whose focus is origin, eccentricity $\sqrt{2}$ and directrix $x + y + 1 = 0$ is

A. $15x^2 - 24xy + 8y^2 + 12x + 2y - 19 = 0$

B. $2xy + 2x + 2y + 1 = 0$

C. $11x^2 + 24xy + 4y^2 - 74x - 48y + 99 = 0$

D. $7x^2 + 12xy - 2y^2 - 2x + 14y - 22 = 0$

Answer: 2



Watch Video Solution

2. The eccentricity of the hyperbola whose latus rectum is equal to $1/3$ of its transverse axis is

A. $2/\sqrt{3}$

B. $\sqrt{5/2}$

C. $\sqrt{2/2}$

D. $\sqrt{3}/2$

Answer: 1



Watch Video Solution

3. The angle between the asymptotes of the hyperbola $x^2 - 3y^2 = 1$ is

A. $\pi/3$

B. $\pi/6$

C. $\pi/2$

D. $\pi/4$

Answer: 1



Watch Video Solution

4. The product of the distance from any point on the hyperbola $x^2/4 - y^2/1 = 1$ to its two asymptotes is

A. $4/5$

B. $5/4$

C. $1/4$

D. none

Answer: 1



Watch Video Solution

5. The curve represented by $x = \sec \theta + \tan \theta$, $y = \sec \theta - \tan \theta$ is

- A. a parabola
- B. an ellipse
- C. a circle
- D. a rectangular hyperbola

Answer: 4



[Watch Video Solution](#)

6. The condition for the line $px + qy + r = 0$ to be a normal to the rectangular hyperbola $xy = c^2$ is

- A. $p < q < 0$
- B. $p > 0, q > 0$
- C. $p < 0, q < 0$
- D. $p < 0, q < 0$

Answer: 3



[View Text Solution](#)

7. If the tangent and normal to a rectangular hyperbola $x^2 - y^2 = a^2$ cut off intercepts a_1 and a_2 on one axis and b_1 and b_2 on the other then

A. $a_1 a_2 = b_1 b_2$

B. $a_1 b_2 = a_2 b_1$

C. $a_1 b_2 + a_2 b_1 = 0$

D. $a_1 a_2 + b_1 b_2 = 0$

Answer: 4



[View Text Solution](#)

8. The locus of the centre of a circle which touches two given circles externally is

A. a circle

B. a parabola

C. an ellipse

D. a hyperbola

Answer: 4



Watch Video Solution

9. The coordinates of a point are $(4 \tan \phi, 3 \sec \phi)$ where ϕ is a parameter, then the point lies on a conic section whose eccentricity is

A. $\frac{5}{3}$

B. $\frac{5}{4}$

C. $\frac{3}{4}$

D. $\frac{3}{5}$

Answer: 1

 [Watch Video Solution](#)

10. The centre of rectangular hyperbola lies on the line $y = 2x$. If one asymptotes is $x + y + c = 0$ then the other asymptote is

A. $3x - 3y - c = 0$

B. $2x - y + c = 0$

C. $x - y - c = 0$

D. $x - y + 2c = 0$

Answer: 1

 [Watch Video Solution](#)

11. The locus of the mid points of the chords of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ which pass through a foot of the directrix in the first quadrant is

A. $\frac{x^2}{a^2} - \frac{y^2}{b^2} + \frac{x}{ea} = -0$

B. $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{x}{ae} = 0$

C. $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{x}{ae} = 0$

D. $\frac{x^2}{a^2} - \frac{y^2}{b^2} - \frac{x}{ae} = 0$

Answer: 4



View Text Solution

Exercise 1 A

1. The equation of the conic with focus at $(1, -1)$ directrix along $x - y + 1 = 0$ and with eccentricity $\sqrt{2}$ is

A. $x^2 - y^2 = 1$

B. $xy = 1$

C. $2xy - 4x + 4y + 1 = 0$

D. $2xy + 4x - 4y - 1 = 0$

Answer: C



Watch Video Solution

2. One of the foci of the hyperbola is origin and the corresponding directrix is $3x + 4y + 1 = 0$. The eccentricity of the hyperbola is $\sqrt{5}$. The equation of the hyperbola is

A. $4x^2 + 11y^2 + 24xy + 6x + 8y + 1 = 0$

B. $8x^2 + 9y^2 + 24xy + 6x + 6y + 1 = 0$

C. $8x^2 + 9y^2 + 24xy + 6x + 8y + 1 = 0$

D. $8x^2 + 9y^2 - 24xy + 6x + 8y + 1 = 0$

Answer: A



Watch Video Solution

3. The equation of the hyperbola whose foci are $(\pm 5, 0)$ and eccentricity $5/3$ is

A. $\frac{x^2}{9} - \frac{y^2}{16} = 1$

B. $\frac{x^2}{4} - \frac{y^2}{16} = 1$

C. $\frac{x^2}{9} + \frac{y^2}{6} = 1$

D. $\frac{x^2}{4} + \frac{y^2}{16} = 1$

Answer: A



[Watch Video Solution](#)

4. The equation of the hyperbola whose centre is $(5, 2)$ vertex is $(9, 2)$ and the length of conjugate axis is 6 is

A. $\frac{(x - 5)^2}{16} + \frac{(y - 2)^2}{9} = 1$

B. $\frac{(x - 5)^2}{16} - \frac{(y - 2)^2}{19} = 1$

C. $\frac{(x - 5)^2}{16} - \frac{(y - 2)^2}{9} = 1$

$$D. \frac{(x + 5)^2}{29} = 1$$

Answer: C



Watch Video Solution

5. The equation of the hyperbola with its axes as coordinate axes, whose transverse axis is 8 and eccentricity $\frac{3}{2}$ is

$$A. \frac{x^2}{9} - \frac{y^2}{4} = 1$$

$$B. \frac{x^2}{16} - \frac{y^2}{20} = 1$$

$$C. \frac{x^2}{25} - \frac{y^2}{11} = 1$$

$$D. \frac{x^2}{16} - \frac{y^2}{9} = 1$$

Answer: B



Watch Video Solution

6. The equation of the hyperbola with its transverse axis parallel to x-axis and its centre is $(3, -2)$ the length of axes, are 8,6 is

A. $\frac{(x - 3)^2}{16} - \frac{(y + 2)^2}{9} = 1$

B. $\frac{(x + 2)^2}{25} - \frac{(y - 1)^2}{11} = 1$

C. $\frac{(x - 3)^2}{6} - \frac{(y - 2)^2}{9} = 1$

D. $\frac{(x - 2)^2}{16} - \frac{(y - 3)^2}{19} = 1$

Answer: A



[Watch Video Solution](#)

7. The equation of the hyperbola with its transverse axis parallel to x-axis and its centre is $(-2, 1)$ the length of transverse axis is 10 and eccentricity $6/5$ is

A. $\frac{(x - 3)^2}{16} - \frac{(y + 2)^2}{9} = 1$

B. $\frac{(x + 2)^2}{25} - \frac{(y - 1)^2}{11} = 1$

$$C. \frac{(x-3)^2}{6} - \frac{(y-2)^2}{9} = 1$$

$$D. \frac{(x-2)^2}{16} - \frac{(y-3)^2}{19} = 1$$

Answer: B

 [Watch Video Solution](#)

8. The equation of the hyperbola with its transverse axis is parallel to the y-axis and its centre is $(2, -3)$ the length of the transverse axis is 12 and eccentricity $7/6$ is

$$A. \frac{(y+3)^2}{6} - \frac{(x+2)^2}{3} = 1$$

$$B. \frac{(y-3)^2}{36} + \frac{(x-2)^2}{13} = 1$$

$$C. \frac{(y+3)^2}{9} - \frac{(x-4)^2}{4} = 1$$

$$D. \frac{(y+3)^2}{36} - \frac{(x-2)^2}{13} = 1$$

Answer: D

 [Watch Video Solution](#)

9. The equation of the hyperbola whose centre is (1,2). One focus is (6,2) and transverse axis 6 is.

A. $16(x - 1)^2 - 9(y - 2)^2 = 144$

B. $9(x - 1)^2 - 16(y - 2)^2 = 144$

C. $16(x - 1)^2 - 25(y - 2)^2 = 200$

D. $25(x - 1)^2 - 16(y - 2)^2 = 200$

Answer: A



[Watch Video Solution](#)

10. The equation to hyperbola whose centre is (0,0) distance between the foci is 18 and distance between the directrices is 8 is

A. $x^2 / 45 - y^2 / 36 = 1$

B. $x^2 / 36 - y^2 / 45 = 1$

$$C. x^2 / 36 - y^2 / 25 = 1$$

$$D. x^2 / 25 - y^2 / 36 = 1$$

Answer: B



Watch Video Solution

11. The equation to the hyperbola referred to its axes as coordinate axes , whose latus rectum is 4 and eccentricity is 3 is

$$A. 16x^2 - 2y^2 = 1$$

$$B. 2x^2 - 16y^2 = 1$$

$$C. 8x^2 = 2y^2 = 1$$

$$D. 3x^2 - 8y^2 = 1$$

Answer: A



Watch Video Solution

12. The equation of the hyperbola whose transverse axis is 14 and whose vertex bisects the distance between centre and the focus is

A. $x^2 / 14 - y^2 / 49 = 1$

B. $x^2 / 147 - y^2 / 14 = 1$

C. $x^2 / 49 - y^2 / 147 = 1$

D. $x^2 / 147 - y^2 / 49 = 1$

Answer: C



Watch Video Solution

13. The vertices of a hyperbola are $(2, 0)$, $(-2, 0)$ and the foci are $(3, 0)$, $(-3, 0)$. The equation of the hyperbola is

A. $x^2 / 5 - y^2 / 4 = 1$

B. $x^2 / 4 - y^2 / 5 = 1$

C. $x^2 / 5 - y^2 / 2 = 1$

$$D. x^2/2 - y^2/5 = 1$$

Answer: B



Watch Video Solution

14. The equation of the transverse and conjugate axes of a hyperbola are respectively $x + 2y - 3 = 0$, $2x - y + 4 = 0$ and their respective lengths are $\sqrt{2}$ and $2/\sqrt{3}$. The equation of the hyperbola is

A. $\frac{2}{5}(x + 2y - 3)^2 - \frac{3}{5}(2x - y + 4)^2 = 1$

B. $\frac{2}{5}(2x - y + 4)^2 - \frac{3}{5}(x + 2y - 3)^2 = 1$

C. $2(2x - y + 4)^2 - 3(x + 2y - 3)^2 = 1$

D. $2(x + 2y - 3)^2 - 3(2x - y + 4)^2 = 1$

Answer: A



Watch Video Solution

15. the centre of the hyperbola $9x^2 - 16y^2 + 72x - 32y - 16 = 0$ is

- A. (1, 1)
- B. (1, - 1)
- C. (- 1, 1)
- D. (- 4, - 1)

Answer: D



[Watch Video Solution](#)

16. The vertices of the hyperbola $\frac{(x - 2)^2}{9} - \frac{(y - 3)^2}{4} = 1$ are

- A. (5, 3), (- 1, 3)
- B. (5, - 3), (1, 3)
- C. (- 5, 3), (- 1, - 3)
- D. (5, 3), (1, 3)

Answer: A



Watch Video Solution

17. The vertices of the hyperbola $x^2 - 3y^2 + 2x + 12y + 1 = 0$ are

A. $(\pm 3, 0)$

B. $(1 \pm 2, 2)$

C. $(-1, 2 \pm 2)$

D. $(1, -2 \pm 3)$

Answer: C



Watch Video Solution

18. The foci of the hyperbola $2x^2 - y^2 - 4x + 4y - 10 = 0$ are

A. $(\pm \sqrt{13}, 0)$

B. $(1 + -2\sqrt{3}, 2)$

C. $(2 \pm 3\sqrt{3}, 3)$

D. $(3 \pm 3\sqrt{3}, 2)$

Answer: B



Watch Video Solution

19. The foci of the hyperbola $9x^2 - 16y^2 + 18x + 32y - 151 = 0$ are

A. $(2, 1), (-6, 1)$

B. $(-2, 5), (-2, -3)$

C. $(4, 1), (-6, 1)$

D. $(-2, 4), (-2, 2)$

Answer: C



Watch Video Solution

20. The distance between the foci of the hyperbola $x^2 - 3y^2 - 4x - 6y - 11 = 0$ is

A. 4

B. 6

C. 8

D. 10

Answer: C



[Watch Video Solution](#)

21. The length of the transverse axis of the hyperbola $9x^2 - 16y^2 - 18x - 32y - 151 = 0$ is

A. 8

B. 4

C. 6

D. 2

Answer: A



[Watch Video Solution](#)

22. The length of the transverse axis of the hyperbola

$$4x^2 - 9y^2 + 8x + 40 = 0 \text{ is}$$

A. 4

B. 6

C. $2\sqrt{3}$

D. $4\sqrt{2}$

Answer: A



[Watch Video Solution](#)

23. The length of the conjugate axis of the hyperbola $9x^2 - 16y^2 - 18x - 64y + 89 = 0$ is

- A. 8
- B. 6
- C. 4
- D. 5

Answer: A



[Watch Video Solution](#)

24. The length of the latus rectum of the hyperbola $x^2 - 4y^2 = 4$ is

- A. 2
- B. 1
- C. 4
- D. 3

Answer: B



Watch Video Solution

25. The length of the latus rectum of the hyperbola

$$9x^2 - 16y^2 + 72x - 32y - 16 = 0 \text{ is}$$

A. $9/2$

B. $32/3$

C. $\frac{11}{5}$

D. $21/5$

Answer: A



Watch Video Solution

26. The eccentricity of the hyperbola $9x^2 - 16y^2 = 144$ is

A. $4/3$

B. $5/4$

C. $4/5$

D. $3/5$

Answer: B



Watch Video Solution

27. The eccentricity of the hyperbola $9x^2 - 16y^2 + 72x - 32y - 16 = 0$ is

A. $5/4$

B. $4/5$

C. $9/16$

D. $16/9$

Answer: A

 [Watch Video Solution](#)

28. The eccentricity of the hyperbola $4x^2 - 9y^2 = 36$ is

A. a/b

B. \sqrt{b}/a

C. $\sqrt{\frac{13}{3}}$

D. $\sqrt{13}/3$

Answer: D

 [Watch Video Solution](#)

29. The eccentricity of the rectangular hyperbola is

A. e

B. ∞

C. $\sqrt{2}$

D. $4\sqrt{3}$

Answer: C



Watch Video Solution

30. The eccentricity of the hyperbola whose latus rectum is equal to half of its transverse axis is

A. $\sqrt{3/2}$

B. $\sqrt{5/2}$

C. $\sqrt{2/2}$

D. $\sqrt{3}/2$

Answer: A



Watch Video Solution

31. The eccentricity of the hyperbola whose latus rectum is equal to half of its conjugate axis is

A. $\sqrt{3/2}$

B. $\sqrt{5}/2$

C. $\sqrt{(2/2)}$

D. $\sqrt{3}/2$

Answer: B



[Watch Video Solution](#)

32. The eccentricity of the hyperbola whose length of the latus rectum is equal to 8 and the length of its conjugates axis is equal to half of the distance between its foci is

A. $\frac{4}{3}$

B. $\frac{4}{\sqrt{3}}$

C. $\frac{2}{\sqrt{3}}$

D. $\sqrt{3}$

Answer: C



Watch Video Solution

33. If e and e' are the eccentricity of the hyperbola $x^2/a^2 - y^2/b^2 = 1$ and its conjugate HYPERBOLA then $[\frac{1}{e^2} + \frac{1}{e'^2}]$

A. 3

B. 2

C. 1

D. 0

Answer: C



Watch Video Solution

34. If e_1 and e_2 are the eccentricities of a hyperbola and its conjugates then ,

A. $e_1^2 + e_2^2 = 3$

B. $e_1 + e_2 = 4$

C. $e_1^2 + e_2^2 = e_1^2 e_2^2$

D. $e_1 = e_2$

Answer: C



Watch Video Solution

35. If the eccentricities of a hyperbola is $\sqrt{3}$,then the eccentricity of its conjugates hyperbola is

A. $\sqrt{2}$

B. $\sqrt{3}$

C. $\sqrt{3/2}$

D. $2\sqrt{3}$

Answer: C



[Watch Video Solution](#)

36. If e and e_1 are the eccentricities of the hyperbola $xy = c^2$, $x^2 - y^2 = c^2$ then $e^2 + e_1^2$ is equal to

A. 1

B. 4

C. 6

D. 8

Answer: B



[Watch Video Solution](#)

37. If $(5,12)$, $(24,7)$ are the foci of the hyperbola passing through origin, then its eccentricity is

A. $\sqrt{386}/38$ or $\sqrt{386}/12$

B. $\sqrt{386}/12$ or $\sqrt{386}/7$

C. $\sqrt{386}/36$ or $\sqrt{386}/19$

D. none

Answer: A



[Watch Video Solution](#)

38. The distance between the foci is $4\sqrt{13}$ and the length of conjugate axis is 8 then the eccentricity of the hyperbola is

A. $\sqrt{13}/3$

B. $\sqrt{13}/5$

C. $\sqrt{13}/7$

D. none

Answer: A



[Watch Video Solution](#)

39. The locus of the point of intersection of the lines $\sqrt{3}x - y - 4\sqrt{3}k = 0$ and $kx\sqrt{3} + ky - 4\sqrt{3} = 0$ is a hyperbola of eccentricity

A. 1

B. 2

C. 3

D. 4

Answer: B



[Watch Video Solution](#)

40. If the latusrectum subtends a right angle at the centre of the hyperbola then its eccentricity

A. $e = \frac{\sqrt{13}}{2}$

B. $3 = \frac{\sqrt{5} - 1}{2}$

C. $e = \frac{\sqrt{5} + 1}{2}$

D. $e = (\sqrt{3} + 1) \frac{1}{2}$

Answer: C

 [Watch Video Solution](#)

41. If the latus rectum of a hyperbola forms an equilateral triangle with the vertex at the centre of the hyperbola, then its eccentricity $e =$

A. $\frac{\sqrt{5} + 1}{2}$

B. $\frac{\sqrt{11} + 1}{2}$

C. $\frac{\sqrt{13} + 1}{2\sqrt{3}}$

D. $\frac{\sqrt{13} - 1}{2\sqrt{3}}$

Answer: C



Watch Video Solution

42. If the latus rectum of a hyperbola through one focus subtends 60° at the other focus then its eccentricity $e =$

A. $\sqrt{2}$

B. $\sqrt{3}$

C. $\sqrt{5}$

D. $\sqrt{6}$

Answer: B



Watch Video Solution

43. If the latus rectum through one focus subtends a right angle at the farther vertex of the hyperbola then its eccentricity is

A. 4

B. $\sqrt{3}$

C. 2

D. $\sqrt{2}$

Answer: C



[Watch Video Solution](#)

44. The latus rectum of a hyperbola $\frac{x^2}{16} - \frac{y^2}{p} = 1$ is $4\frac{1}{2}$. Its eccentricity

e=

A. $4/5$

B. $5/4$

C. $3/4$

D. $4/3$

Answer: B



[Watch Video Solution](#)

45. Let LL' be the latus rectum through the focus S of a hyperbola and A' be the farther vertex of the conic. If $\triangle A'LL'$ is equilateral then its eccentricity $e =$

A. $\sqrt{3}$

B. $\sqrt{3} + 1$

C. $(\sqrt{3} + 1) / \sqrt{2}$

D. $(\sqrt{3} + 1) / \sqrt{3}$

Answer: D



[Watch Video Solution](#)

46. The eccentricity of the hyperbola $x = \frac{a}{2}(t + 1/t)$, $y = \frac{a}{2}(t - 1/t)$

is

A. $\sqrt{3}$

B. $\sqrt{2}$

C. $2\sqrt{3}$

D. $3\sqrt{2}$

Answer: B



[Watch Video Solution](#)

47. The locus of the point $\left(\frac{e^t + e^{-t}}{2}, \frac{e^t - e^{-t}}{2}\right)$ is a hyperbola of eccentricity

A. $\sqrt{3}$

B. 3

C. $\sqrt{2}$

D. 2

Answer: C



Watch Video Solution

48. The equation of directrices of the hyperbola $5x^2 - 4y^2 - 30x - 8y - 39 = 0$ are

A. $x = \pm 9/5$

B. $x = 3 \pm 8/3$

C. $x = 2 \pm 8/5$

D. $x = 3 \pm 16/5$

Answer: B



Watch Video Solution

49. The equations of the latus recta of the hyperbola

$$9x^2 - 16y^2 - 18x - 32y - 151 = 0 \text{ are}$$

A. $x = 6, x + 4 = 0$

B. $x = -6, x - 14 = 0$

C. $x = 3, x + 4 = 0$

D. $x = 2, x - 11 = 0$

Answer: A



Watch Video Solution

50. The equation of the conjugate axis of the hyperbola

$$\frac{(x - 5)^2}{16} - \frac{(y - 4)^2}{9} = 1 \text{ is}$$

A. $y - 4 = 0$

B. $y - 6 = 0$

C. $y + 8 = 0$

D. $y - 2 = 0$

Answer: A



Watch Video Solution

51. The equation of transverse axis of the hyperbola

$$5x^2 - 4y^2 - 30x - 8y - 39 = 0$$
 is

A. $x = 0$

B. $x - 3 = 0$

C. $x - 2 = 0$

D. $x + 3 = 0$

Answer: B



Watch Video Solution

52. The equation of the axes of the hyperbola $9x^2 - 16y^2 + 72x - 32y - 16 = 0$ are

A. $y + 1 = 0, x + 4 = 0$

B. $y + 2 = 0, x + 3 = 0$

C. $y - 1 = 0, x - 4 = 0$

D. $y + 3 = 0, x - 4 = 0$

Answer: A



[Watch Video Solution](#)

53. The equation of the hyperbola whose eccentricity 2 and foci are the foci of the ellips $x^2/25 + y^2/9 = 1$ is

A. $\frac{x^2}{4} - \frac{y^2}{12} = 1$

B. $\frac{x^2}{14} + \frac{y^2}{12} = 1$

C. $\frac{x^2}{15} + \frac{y^2}{8} = 1$

D. $\frac{x^2}{6} - \frac{y^2}{8} = 1$

Answer: A



Watch Video Solution

54. PN is the ordinate of any point P on the hyperbola $x^2/a^2 - y^2/b^2 = 1$. If Q divides AP in the ratio a^2, b^2 then NQ is

- A. perpendicular to A'P
- B. Parallel to A'P
- C. perpendicular to OP
- D. none

Answer: A



View Text Solution

55. If the foci of the ellips $\frac{x^2}{25} + \frac{y^2}{16} = 1$ and the hyperbola $\frac{x^2}{4} - \frac{y^2}{b^2} = 1$ coincide, then $b^2 =$

A. 4

B. 5

C. 8

D. 9

Answer: B



[Watch Video Solution](#)

56. The foci of the ellips $\frac{x^2}{16} + \frac{y^2}{b^2} = 1$ and the hyperbola $\frac{x^2}{144} - \frac{y^2}{81} = \frac{1}{25}$ coincide, then the value of b^2 is

A. 1

B. 5

C. 7

D. 9

Answer: C



Watch Video Solution

57. For the hyperbola $\frac{x^2}{\cos^2 \alpha} - \frac{y^2}{\sin^2 \alpha} = 1$, which of the following remains constant when α varies?

A. Eccentricity

B. Directrix

C. Abscissae of vertices

D. Abscissae of foci

Answer: D



Watch Video Solution

58. A hyperbola passes through a focus of the ellips $\frac{x^2}{169} + \frac{y^2}{25} = 1$. Its transverse and conjugates axes coincide respectively with the major and minor axes of the ellips The product of eccetricities is 1. Then the equation of the hyperbola is

A. $\frac{x^2}{169} = 1$

B. $\frac{x^2}{144} - \frac{y^2}{25} = 1$

C. $\frac{x^2}{25} - \frac{y^2}{9} = 1$

D. $\frac{x^2}{144} - \frac{y^2}{9} = 1$

Answer: B



[Watch Video Solution](#)

59. The equation of the tangent to the hyperbola $3x^2 - 2y^2 = 10$ at $(2, 1)$ is

A. $3x - y - 5 = 0$

B. $3x + y + 15 = 0$

C. $3x - 3y - 15 = 0$

D. $3x - 2y - 3 = 0$

Answer: A



Watch Video Solution

60. The equation of the normal to the hyperbola $x^2 - 4y^2 = 5at(3, -1)$ is

A. $4x + 3y - 15 = 0$

B. $4x - 3y - 15 = 0$

C. $4x - 3y + 5 = 0$

D. $4x + 4y + 15 = 0$

Answer: B



Watch Video Solution

61. The sum and product of the slopes of the tangents to the hyperbola $2x^2 - 3y^2 = 6$ drawn from the point $(-1,1)$ are

A. 1, -3

B. 1, $-3/2$

C. 2, $-3/2$

D. 3, $-2/2$

Answer: B



Watch Video Solution

62. The condition that the line $y = mx + c$ may be a tangent to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ is

A. $c^2 = a^2m^2 - b^2$

B. $c^2 = b^2 - a^2m^2$

$$C. c^2 = a^2 - b^2 m^2$$

$$D. c^2 = a^2 + b^2 m^2$$

Answer: A



Watch Video Solution

63. The condition that the line $x \cos \alpha + y \sin \alpha = p$ to be a tangent to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ is

$$A. a^2 \cos^2 \alpha + b^2 \sin^2 \alpha = p^2$$

$$B. a^2 \cos \alpha - b^2 \sin^2 \alpha = p^2$$

$$C. a^2 \sin^2 \alpha + b^2 \cos^2 \alpha = p^2$$

$$D. a^2 \sin^2 \alpha + b^2 \cos^2 \alpha = p^2$$

Answer: B



Watch Video Solution

64. The condition that the line $\frac{x}{p} + \frac{y}{q} = 1$ to be a tangent to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is

A. $\frac{a^2}{p^2} + \frac{b^2}{q^2} = 1$

B. $\frac{a^2}{p^2} - \frac{b^2}{q^2} = 1$

C. $\frac{b^2}{p^2} - \frac{a^2}{q^2} = 1$

D. $\frac{a^2}{q^2} - \frac{b^2}{p^2} = 1$

Answer: B



Watch Video Solution

65. In the line $3x - y = k$ is a tangent to the hyperbola $3x^2 - y^2 = 3$, then $k =$

A. $\pm\sqrt{7}$

B. $\pm\sqrt{3}$

C. $\pm\sqrt{5}$

D. $\pm \sqrt{6}$

Answer: D



Watch Video Solution

66. The values of m for which the line $y = mx + 2$ become a tangent to the hyperbola $4x^2 - 9y^2 = 36$ is

A. $\pm \frac{2}{3}$

B. $\pm \frac{2\sqrt{2}}{3}$

C. $\pm \frac{8}{9}$

D. $\pm \frac{4\sqrt{2}}{3}$

Answer: B



Watch Video Solution

67. The equation of the tangents to the hyperbola $3x^2 - 4y^2 = 12$ which are parallel to the line $2x + y + 7 = 0$ are

A. $2x + y \pm \sqrt{13} = 0$

B. $3x - y \pm \sqrt{6} = 0$

C. $3x - y \pm 2 = 0$

D. $3x - y \pm \sqrt{2} = 0$

Answer: A



[Watch Video Solution](#)

68. The equations of the tangents to the hyperbola $2x^2 - 3y^2 = 6$ which are perpendicular to the line $x - 2y + 5 = 0$ are

A. $x - 2y \pm \sqrt{11} = 0$

B. $2x + y \pm \sqrt{10} = 0$

C. $x + 5y \pm \sqrt{21} = 0$

$$D. x + 6y \pm \sqrt{31} = 0$$

Answer: B



Watch Video Solution

69. The equations of the tangents to the hyperbola $9x^2 - 16y^2 = 144$ at the ends of latus rectum are

A. $5x \pm 2y = 26$

B. $5x + - 3y = 26$

C. $5x \pm 4y = 16$

D. $5x \pm 5y = 16$

Answer: C



Watch Video Solution

70. The equations of the tangents to the hyperbola $3x^2 - 4y^2 = 12$ which make equal intercepts on the axes is

A. $x + y = \pm 1$

B. $x - y = \pm 1$

C. $2x + y = \pm 1$

D. none

Answer: A



Watch Video Solution

71. The equations of the tangents to the hyperbola $4x^2 - 5y^2 = 20$ which make an angle 60° with the transverse axis are

A. $y = \sqrt{5}x \pm \sqrt{21}$

B. $y = \sqrt{5}x \pm \sqrt{11}$

C. $y = \sqrt{7}x \pm \sqrt{21}$

$$D. y = \sqrt{3}x \pm \sqrt{11}$$

Answer: D



Watch Video Solution

72. Equation of one of the tangents passing through (2, 8) to the hyperbola $5x^2 - y^2 = 5$ is

A. $3x + y - 14 = 0$

B. $3x - y + 2 = 0$

C. $x + y + 3 = 0$

D. $x - y + 6 = 0$

Answer: B



Watch Video Solution

73. The point of contact of $5x+6y+1=0$ to the hyperbola $2x^2 - 3y^2 = 2$ is

- A. (5, 4)
- B. (-5, 4)
- C. (-5, -4)
- D. (5, -4)

Answer: B



[Watch Video Solution](#)

74. The number of tangents to $x^2/9 - y^2/4 = 1$ through (6,2) is

- A. 0
- B. 1
- C. 2
- D. 3

Answer: A



Watch Video Solution

75. If m_1, m_2 are slopes of the tangents to the hyperbola $x^2/25 - y^2/16 = 1$ which pass through the point (6,2) then

A. $m_1 + m_2 = 24/11$

B. $m_1 + m_2 = 48/11$

C. $m_1 + m_2 = 28/11$

D. $m_1 m_2 = 11/20$

Answer: A



Watch Video Solution

76. The equations of the director circle of $x^2/12 - y^2/8 = 1$ is

A. $x^2 + y^2 = 16$

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

C. $x^2 + y^2 = -9$

D. $x^2 - y^2 = 4$

Answer: B



Watch Video Solution

77. The equations of the auxiliary circle of $x^2/16 - y^2/25 = 1$ is

A. $x^2 + y^2 = 16$

B. $x^2 + y^2 = 9$

C. $x^2 + y^2 = 5$

D. $x^2 + y^2 = 15$

Answer: A



Watch Video Solution

78. The radius of the auxiliary circle of the hyperbola $x^2/25 - y^2/9 = 1$

is

A. 3

B. 4

C. 5

D. none

Answer: C



[Watch Video Solution](#)

79. The tangents at a point P on $x^2/a^2 - y^2/b^2 = 1$ cuts one of its directrices in Q. Then PQ subtends at the corresponding focus an angle of

A. $\pi/3$

B. $\pi/6$

C. $\pi/4$

D. $\pi/2$

Answer: D



[View Text Solution](#)

80. The locus of the point of intersection of two tangents of the hyperbola

$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ which make an angle 30° with one another is

A. $(x^2 + y^2/b^2 + a^2)^2 = 12(a^2y^2 - b^2x^2 + a^2b^2)$

B. $(x^2 + y^2 - a^2 + b^2)^2 = 4(a^2y^2 - b^2x^2 + a^2b^2)$

C. $(x^2 + y^2 - a^2 + b^2)^2 = 4(a^2y^2 - b^2x^2 + a^2b^2)$

D. $x^2 + y^2 = a^2 - b^2$

Answer: A



[View Text Solution](#)

81. The locus of the point of intersection of two tangents of the hyperbola

$x^2/a^2 - y^2/b^2 = 1$ which make an angle 45° with one another is

A. $(x^2 + y^2/b^2 + a^2)^2 = 12(a^2y^2 - b^2x^2 + a^2b^2)$

B. $(x^2 + y^2 - a^2 + b^2)^2 = 4(a^2y^2 - b^2x^2 + a^2b^2)$

C. $(x^2 + y^2 - a^2 + b^2)^2 = 4(a^2y^2 - b^2x^2 + a^2b^2)$

D. $x^2 + y^2 = a^2 - b^2$

Answer: B



[View Text Solution](#)

82. The locus of the point of intersection of two tangents to the

hyperbola $x^2/a^2 - y^2/b^2 = 1$ which make an angle 90° with one

another is

A. $x^2 + y^2 = a^2 + b^2$

B. $x^2 + y^2 = a^2 - b^2$

$$C. x^2 - y^2 = a^2 - b^2$$

$$D. x^2 - y^2 = a^2 + b^2$$

Answer: B



Watch Video Solution

83. Tangents to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ make angle θ_1, θ_2 with the transverse axis. If θ_1, θ_2 are complementary then the locus of the point of intersection of the tangents is

$$A. x^2 - y^2 = a^2 + b^2$$

$$B. x^2 + y^2 = a^2 - b^2$$

$$C. x^2 - y^2 = a^2 - b^2$$

D. NONE

Answer: A



Watch Video Solution

84. Tangents to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ make angle θ_1, θ_2 with the transverse axis. The equations of the locus of their intersection when $\tan(\theta_1 + \theta_2) = k$ is

A. $k(x^3 - y^3 - a^3 - b^3) = 2xy$

B. $k(x^2 - y^2 - a^2 + b^2) = 4xy$

C. $k(x^2 - y^2 - a^2 - b^2) = 2xy$

D. $k(x^2 + y^2 + a^2 - b^2) = 2xy$

Answer: C

 [Watch Video Solution](#)

85. Tangents to $x^2/a^2 - y^2/b^2 = 1$ make angles θ_1, θ_2 with transverse axis. The equation of the locus of their intersection when $\cot \theta_1 + \cot \theta_2 = k$ is

A. $k(x^2 - a^2) = 2xy$

B. $k(y^2 + b^2) = 2xy$

C. $k(x^2 + a^2) = 2xy$

D. $k(y^2 - b^2) = 2xy$

Answer: B



Watch Video Solution

86. Tangents drawn from (α, β) to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ make angles θ_1 and θ_2 with the axis. If $\tan \theta_1 \tan \theta_2 = 1$ then $\alpha^2 - \beta^2 =$

A. a^2

B. b^2

C. $a^2 + b^2$

D. $a^2 - b^2$

Answer: C



Watch Video Solution

87. The locus of the point of intersection of tangents to the hyperbola $x^2 - y^2 = a^2$ which include an angle 45° is

A. $(x^2 + y^2)^2 = 4a^2(x^2 + y^2 + a^2)$

B. $(x^2 + y^2)^2 = 4a^2(x^2 - y^2 + a^2)$

C. $(x^2 + y^2)^2 = 4a^2(y^2 - x^2 + a^2)$

D. $(x^2 + y^2)^2 = 4a^2(x^2 + y^2 - a^2)$

Answer: C



[View Text Solution](#)

88. A line through the origin meets the circle $x^2 + y^2 = a^2$ at P and the hyperbola $x^2 - y^2 = a^2$ at Q the locus of the point of intersection of the tangents at P to the circle and with the tangents at Q to the hyperbola is

A. $(x^4 + y^4) = a^6$

B. $(a^4 + 4y^4)x^2 = a^6$

C. $(a^4 + 4x^4)y^2 = a^6$

D. none

Answer: B



[View Text Solution](#)

89. The product of the perpendicular from the foci on any tangent to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ is

A. b^2

B. a^2

C. $-b^2$

D. $2b^2$

Answer: A



[Watch Video Solution](#)

90. From any point on the hyperbola $x^2 - y^2 = a^2 - b^2$ two tangents are drawn to the ellipse $x^2/a^2 + y^2/b^2 = 1$ Then they make angles α and β such that

A. $\tan \alpha - \tan \beta + 1$

B. $\tan \alpha + \tan \beta = 1$

C. $\tan \alpha \tan \beta = 1$

D. $\tan \alpha \tan \beta = -1$

Answer: C



[View Text Solution](#)

91. The equations to the common tangents to the two hyperbolas $x^2/a^2 - y^2/b^2 = 1$ and $y^2/a^2 - x^2/b^2 = 1$ are

A. $y = x \pm \sqrt{b^2 - a^2}$

$$B. y = \pm x \pm \sqrt{a^2 - b^2}$$

$$C. y = \pm x \pm (a^2 - b^2)$$

$$D. y = \pm x \pm \sqrt{a^2 + b^2}$$

Answer: B



Watch Video Solution

92. The equation of the common tangents drawn to the curves $y^2 = 8x$ and $xy = -1$ is

$$A. y = 2x + 1$$

$$B. 2y = x + 6$$

$$C. y = x + 2$$

$$D. 3y = 8x + 2$$

Answer: C



Watch Video Solution

93. The length of the straight line $x - 3y = 1$ intercept by the hyperbola $x^2 - 4y^2 = 1$ is

A. $6\sqrt{2/3}$

B. $6\sqrt{2/5}$

C. $3\sqrt{2/5}$

D. $2\sqrt{2/5}$

Answer: B



Watch Video Solution

94. The product of the perpendicular from the foci on any tangent to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ is

A. $(x^2 + y^2)^2 = a^2x^2 + b^2y^2$

B. $(x^2 + y^2)^2 = a^2x^2 - b^2y^2$

C. $(x^2 - y^2)^2 = a^2x^2 + b^2y^2$

D. $(x^2 - y^2)^2 = a^2x^2 - b^2y^2$

Answer: B



Watch Video Solution

95. The equation to the pair of asymptotes of the hyperbola

$2x^2 - y^2 = 1$ is

A. $2x^2 + y^2 = 0$

B. $2x^2 - y^2 = 0$

C. $x^2 + 2y^2 = 0$

D. $x^2 - 2y^2 = 0$

Answer: B



Watch Video Solution

96. The equations of the asymptotes of the hyperbola $4x^2 - 9y^2 = 36$ are

A. $2x \pm 3y = 0$

B. $2x \pm 5y = 0$

C. $2x \pm 6y = 0$

D. $2x \pm 8y = 0$

Answer: A



[Watch Video Solution](#)

97. The angle between the asymptotes of the hyperbola $x^2 - 3y^2 = 3$ is

A. $\pi/3$

B. $\pi/5$

C. $\pi/2$

D. $\pi/7$

Answer: A



Watch Video Solution

98. The angles between the asymptotes of the hyperbola

$$x^2/a^2 - y^2/b^2 = 1 \text{ is}$$

A. $2 \sin^{-1}(e)$

B. $2 \cos^{-1}(e)$

C. $\tan^{-1}(e)$

D. $2 \sec^{-1}(e)$

Answer: D



Watch Video Solution

99. The angles between asymptotes of the hyperbola $xy = c^2$ is

A. $\pi / 6$

B. $\pi / 4$

C. $\pi / 3$

D. $\pi / 2$

Answer: D



Watch Video Solution

100. The asymptotes of a rectangular hyperbola intersect at an angle

A. $\pi / 6$

B. $\pi / 3$

C. $\pi / 4$

D. $\pi / 2$

Answer: D



Watch Video Solution

101. The combined equation of the asymptotes of the hyperbola

$$xy + x + y + 5 = 0 \text{ is}$$

A. $xy = 0$

B. $(x - 1)(y - 1) = 0$

C. $(x - 1)(y + 1) = 0$

D. $(x + 1)(y + 1) = 0$

Answer: D



[View Text Solution](#)

102. The asymptotes of the hyperbola

$$6x^2 + 13xy + 6y^2 - 7x - 8y - 26 = 0 \text{ are}$$

A. $2x - 3y - 1 = 0, 3x - 2y - 2 = 0$

B. $2x + 3y - 1 = 0, 3x + 2y - 2 = 0$

C. $2x + 2y - 2 = 0, 3x + 3y - 3 = 0$

D. $2x - 3y - 3 = 0, 3x + 3y - 3 = 0$

Answer: B



Watch Video Solution

103. The equation to the hyperbola with vertex $(4,0)$ and having asymptotes $4x \pm 3y = 0$ is

A. $16x^2 - 9y^2 = 256$

B. $16x^2 + 9y^2 = 256$

C. $16x^2 - 9y^2 = 156$

D. $16x^2 - 9y^2 = 56$

Answer: A



Watch Video Solution

104. The equation of the hyperbola whose asymptotes are $3x + 4y - 2 = 0$, $2x + y + 1 = 0$ and which passes through the point (1,1) is

A. $6x^2 + 41xy + 44y^2 - 30x + 2y - 22 = 0$

B. $6x^2 + 11xy + 4y^2 - x + 2y - 22 = 0$

C. $6x^2 - 15xy + 14y^2 - 6x + 12y - 12 = 0$

D. $6x^2 + 13xy + 6y^2 - 38x - 37y - 98 = 0$

Answer: B



[Watch Video Solution](#)

105. The equation of the hyperbola which passes through the point (2, 3) and has the asymptotes $4x + 3y - 7 = 0$ and $x - 2y - 1 = 0$ is

A. $4x^2 + 5xy - 6y^2 - 11x + 11y + 50 = 0$

B. $4x^2 + 5xy - 6y^2 - 11x + 11y - 43 = 0$

$$C. 4x^2 - 5xy - 6y^2 - 11x + 11y + 57 = 0$$

$$D. x^2 - 5xy - y^2 - 11x + 11y - 43 = 0$$

Answer: C



Watch Video Solution

106. If a hyperbola has one focus at the origin and its eccentricity is $\sqrt{2}$.

One of the directrices is $x + y + 1 = 0$, Then equation its asymptotes are

A. $x - 1 = 0, y - 1 = 0$

B. $x + 1 = 0, y + 1 = 0$

C. $x + 3, y + 3 = 0$

D. $x + 2 = 0, y + 2 = 0$

Answer: B



Watch Video Solution

107. If a hyperbola has one focus at the origin and its eccentricity is $\sqrt{2}$. One of the directrices is $x + y + 1 = 0$. Then the centre of the hyperbola is

A. $(-1, -1)$

B. $(1, -1)$

C. $(-2, -1)$

D. $(2, 2)$

Answer: A



[Watch Video Solution](#)

108. The asymptotes of the hyperbola are parallel to $3x+2y=0$, $2x+3y=0$ whose centre is at $(1,2)$ and it passes through the point $(5,3)$ its equation is

A. $6x^2 + 13xy + 6y^2 - 38x - 37y + 56 = 0$

B. $6x^2 + 13xy + 6y^2 - 38x - 37y - 56 = 0$

C. $6x^2 + 13xy + 6y^2 - 38x - 37y + 98 = 0$

D. $6x^2 + 13xy + 6y^2 - 38x - 37y - 56 = 0$

Answer: D



Watch Video Solution

109. The equation of one asymptote of the hyperbola $14x^2 + 38y + 20y^2 + x - 7y - 91 = 0$ is $7x + 5y - 3 = 0$. Then the other asymptote is

A. $2x + 4y = 1$

B. $2x - 4y = 1$

C. $2x + 4y + 1 = 0$

D. $2x - 4y + 1 = 0$

Answer: C



Watch Video Solution

110. The product of the perpendicular from any point on the hyperbola

$x^2/a^2 - y^2/b^2 = 1$ to its asymptotes is

A. $\frac{a^2 + b^2}{a^2b^2}$

B. $\frac{a^2 - b^2}{a^2b^2}$

C. $\frac{a^2b^2}{a^2 + b^2}$

D. $\frac{a^2b^2}{a^2 - b^2}$

Answer: C



Watch Video Solution

111. The product of the perpendicular from the foci on any tangent to the

hyperbola $x^2/a^2 - y^2/b^2 = 1$ is

A. (ae, be)

B. $(a/e, b/e)$

C. $(e/a, e/b)$

D. none

Answer: B



Watch Video Solution

112. Find the product of lengths of the perpendiculars from any point on the hyperbola $\frac{x^2}{16} - \frac{y^2}{9} = 1$ to its asymptotes.

A. $144/25$

B. $25/144$

C. $140/25$

D. none

Answer: A



Watch Video Solution

113. The product of lengths of the perpendiculars from the point of the hyperbola $x^2 - y^2 = 8$ to its asymptotes is

A. 2

B. 3

C. 4

D. 8

Answer: C



[Watch Video Solution](#)

114. The product of lengths of perpendicular from any point on the hyperbola $x^2 - y^2 = 16$ to its asymptotes, is

A. 2

B. 4

C. 8

D. 16

Answer: C



[Watch Video Solution](#)

115. From any point on the hyperbola $x^2/a^2 - y^2/b^2 = 1$ tangents are drawn to the hyperbola $x^2/a^2 - y^2/b^2 = 2$. The area cut-off by the chord of contact on the asymptotes is

A. $ab/2$

B. ab

C. $2ab$

D. $4ab$

Answer: D



[Watch Video Solution](#)

116. P is a point on $x^2/a^2 - y^2/b^2 = 1$ and A_2A' are the vertices of the conic. If PA, PA' meet an asymptotes at K and L then $(KL)^2$

A. $2a^2$

B. $2b^2$

C. $a^2 - b^2$

D. $a^2 + b^2$

Answer: D



[View Text Solution](#)

117. The circle on the line joining the foci of the hyperbola $b^2x^2 - a^2y^2 = a^2b^2$, as diameter cuts the asymptotes at

A. (a, a)

B. (b, a)

C. $(\pm b, \pm a)$

D. $(\pm a, \pm b)$

Answer: D



[View Text Solution](#)

118. The point of intersection of the asymptotes with the directrices lie on

A. Director circle

B. Auxiliary circle

C. Circle on SS as diameter

D. none

Answer: B



[Watch Video Solution](#)

119. The area of the triangle formed by any tangent to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ with its asymptotes is

A. $4a^2b^2$

B. a^2b^2

C. $4ab$

D. ab

Answer: D



[Watch Video Solution](#)

120. The area (in square units) of the equilateral triangle formed by the tangent at $(\sqrt{3}, 0)$ to the hyperbola $x^2 - 3y^2 = 3$ with the pair of asymptotes of the hyperbola is

A. $\sqrt{2}$

B. $\sqrt{3}$

C. $1/\sqrt{3}$

D. $2\sqrt{3}$

Answer: B



Watch Video Solution

121. The equation of the tangents to the hyperbola $\frac{x^2}{9} - \frac{y^2}{4} = 1$ at the point $\theta = \frac{\pi}{3}$ is

A. $4x + 3\sqrt{3}y = 6$

B. $4x - 3\sqrt{3}y = 6$

C. $4x - 2\sqrt{3}y = 6$

D. $4x - 5\sqrt{3}y = 4$

Answer: B



Watch Video Solution

122. The equation of the normal to the hyperbola $\frac{x^2}{25} - \frac{y^2}{9} = 1$ at the point $\theta = \frac{\pi}{4}$ is

A. $5x + 3\sqrt{2}y = 34\sqrt{2}$

B. $5x + \sqrt{2}y = 4\sqrt{2}$

C. $5x - 2\sqrt{2}y = 34\sqrt{2}$

D. $4x - 5\sqrt{3}y = 4$

Answer: A



[Watch Video Solution](#)

123. The foot of the normal $3x + 4y = 7$ to the hyperbola $4x^2 - 3y^2 = 1$ is

A. $(1, 1)$

B. $(1, -1)$

C. $(-1, 1)$

D. $(-1, -1)$

Answer: A



[Watch Video Solution](#)

124. The maximum number of normals to hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ from an external point is

A. 2

B. 4

C. 6

D. 5

Answer: B



[Watch Video Solution](#)

125. The equation of the normal at the positive end of the latus rectum of the hyperbola $x^2 - 3y^2 = 144$ is

A. $\sqrt{3}x + 2y = 32$

B. $\sqrt{3}x - 3y = 48$

C. $3x + \sqrt{3}y = 48$

D. $3x - \sqrt{3}y = 48$

Answer: A



[Watch Video Solution](#)

126. Let A $(2 \sec \theta, 3 \tan \theta)$ and B $(2 \sec \phi, 3 \tan \phi)$ where $\theta + \phi = \frac{\pi}{2}$ be two point on the hyperbola $\frac{x^2}{4} - \frac{y^2}{9} = 1$. If (α, β) is the point of intersection of normals to the hyperbola at A and B, then $\beta =$

A. $-\frac{13}{3}$

B. $\frac{13}{3}$

C. $\frac{3}{13}$

D. $\frac{-3}{13}$

Answer: A

 [Watch Video Solution](#)

127. $P(\theta)$ and $Q(\phi)$ are two point on $x^2/a^2 - y^2/b^2 = 1$ such that $\theta - \phi = 2\alpha$. PQ touches the conic

A. $\frac{x^2 \cos^2 \alpha}{a^2} - \frac{y^2}{b^2} = 1$

B. $\frac{x^2}{a^2} - \frac{x^2 \cos^2 \alpha}{b^2} = 1$

C. $\frac{x^2}{a^2} = \frac{y^2}{b^2} = \cos^2 \alpha$

D. none

Answer: A

 [View Text Solution](#)

128. A normal to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ cuts the axes at K and L. The perpendicular at K and L to axes meet in P. The locus of P is

A. $a^2x^2 + b^2y^2 = (a^2 + b^2)^2$

B. $a^2x^2 - b^2y^2 = (a^2 + b^2)^2$

C. $a^2x^2 + b^2y^2 = (a^2 - b^2)^2$

D. $a^2x^2 - b^2y^2 = (a^2 - b^2)^2$

Answer: B



Watch Video Solution

129. If the normal at θ on the hyperbola $x^2/a^2 - y^2/b^2 = 1$ meets the transverse axis at G, then $AG \cdot A'G =$

A. $a^2(e^4 \sec^2 \theta - 1)$

B. $a^2(e^4 \sec^2 \theta + 1)$

C. $b^2(e^4 \sec^2 \theta - 1)$

D. none

Answer: A

 [Watch Video Solution](#)

130. If α and β are two points on the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ and the chord joining these two points passes through the focus $(ae, 0)$ then

$$e \cos \frac{\alpha - \beta}{2} =$$

A. $\cos \frac{\alpha + \beta}{2}$

B. $\cos \frac{\alpha - \beta}{2}$

C. $\cos \frac{2\alpha - 2\beta}{4}$

D. $\sin \frac{\alpha + \beta}{2}$

Answer: A

 [Watch Video Solution](#)

131. If the axes are rotated through an angle of 45° in the anticlockwise direction then the equation of rectangular hyperbola $x^2 - y^2 = a^2$ changes to

A. $xy = a^2$

B. $xy = 2a^2$

C. $2xy = a^2$

D. none

Answer: D



[View Text Solution](#)

132. If the circle $x^2 + y^2 = a^2$ intersects the hyperbola $xy = c^2$ in four point (x_i, y_i) for $i = 1, 2, 3,$ and 4 then $y_1 + y_2 + y_3 + y_4 =$

A. 0

B. c

C. a

D. c^4

Answer: A



[Watch Video Solution](#)

133. If PN is the perpendicular from a point on a rectangular hyperbola to its asymptotes, the locus of the midpoints of PN is

A. Circle

B. Parabola

C. Ellipse

D. Hyperbola

Answer: D



[View Text Solution](#)

134. The conic represented by $x^2 - 4x + 3y - 1 = 0$ is

- A. parabola
- B. ellipse
- C. hyperbola
- D. none

Answer: A



[Watch Video Solution](#)

135. The conic represented by $2x^2 - 12xy + 23y^2 - 4x - 28y - 48 = 0$ is

- A. parabola
- B. ellipse
- C. hyperbola
- D. none

Answer: B



[Watch Video Solution](#)

136. $x^2 - y^2 + 5x + 8y - 4 = 0$ represents

- A. parabola
- B. ellipse
- C. hyperbola
- D. none

Answer: C



[Watch Video Solution](#)

137. The equation $16x^2 + y^2 + 8xy - 74x - 78y + 212 = 0$ represents

- A. a circle

- B. a parabola
- C. an ellipse
- D. a hyperbola

Answer: B



Watch Video Solution

138. The equation $\frac{x^2}{12 - k} + \frac{y^2}{8 - k} = 1$ represents

- A. a hyperbola if $k < 8$
- B. an ellipse if $k > 8$
- C. a hyperbola if $8 < k$
- D. none

Answer: C



Watch Video Solution

139. A point moves in a plane so that its distances PA and PB from the two fixed points A and b in the plane satisfy the relation $PA - PB = k(k \neq 0,)$ then the locus of P is

- A. a parabola
- B. an ellipse
- C. a hyperbola
- D. a branch of a hyperbola

Answer: C



[View Text Solution](#)

140. The curve represented by $x=3(\cos t + \sin t), y = 4(\cos t - \sin t)$ is

- A. parabola
- B. ellipse
- C. hyperbola

D. none

Answer: B



[Watch Video Solution](#)

141. The curve represented by $x=2(\cos t + \sin t)$, $y = 5(\cos t - \sin t)$ is

A. a circle

B. a parabola

C. an ellipse

D. a hyperbola

Answer: C



[Watch Video Solution](#)

142. The curve represented by $x = a(\cos h\theta + \sin h\theta)$, $y = b(\cos h\theta - \sin h\theta)$ is

- A. a hyperbola
- B. an ellipse
- C. a parabola
- D. a circle

Answer: A



[Watch Video Solution](#)

143. The graph represented by the equations $x = \sin^2 t$, $y = 2 \cos t$ is

- A. a portion of hyperbola
- B. a parabola
- C. a part of sine graph
- D. a part of a hyperbola

Answer: B



[Watch Video Solution](#)

144. If m is a variable the locus of the point of intersection of the lines $x/3 - y/2 = m$ and $x/3 + y/2 = \frac{1}{m}$ is

- A. a parabola
- B. an ellipse
- C. a hyperbola
- D. none

Answer: C



[Watch Video Solution](#)

145. The curve describe parametrically by $x = t^2 + t + 1, y = t^2 - t + 1$ represents

A. a pair of straight lines

B. an ellipse

C. a parabola

D. a hyperbola

Answer: C



Watch Video Solution

146. Chords of an ellipse are drawn through the positive end of minor axis

. Then their midpoint lies on

A. a circle

B. a parabola

C. an ellipse

D. a hyperbola

Answer: C

 [View Text Solution](#)

147. The locus of the point represented by

$$x = 1 + 4 \cos \theta, y = 2 + 3 \sin \theta \text{ is}$$

- A. an ellipse
- B. a parabola
- C. a hyperbola
- D. a circle

Answer: A

 [Watch Video Solution](#)

Exercise 1 B

1. The equation of the chord of contact of the point $(3, -2)$ w.r.t. the hyperbola $2x^2 - 3y^2 = 12$ is

A. $x + y - 2 = 0$

B. $x + y + 2 = 0$

C. $x - y - 2 = 0$

D. $x + y - 3 = 0$

Answer: A

 [Watch Video Solution](#)

2. If $x = 9$ is a chord of contact of the hyperbola $x^2 - y^2 = 9$, then the equation of the tangents at one of the points of contact is

A. $x + \sqrt{3}y + 2 = 0$

B. $3x - 2\sqrt{2}y - 3 = 0$

C. $3x - \sqrt{2}y + 6 = 0$

D. $x + y - 3 = 0$

Answer: B

 [Watch Video Solution](#)

3. The polar of $(-2, 3)$ w.r.t. the hyperbola $4x^2 - 3y^2 = 12$ is

A. $8x + 3y - 4 = 0$

B. $8x + 9y + 12 = 0$

C. $9x + 8y - 6 = 0$

D. $8x + 9y + 7 = 0$

Answer: B

 [Watch Video Solution](#)

4. The pole of the line $2x + 5y - 5 = 0$ w.r.t. The hyperbola $3x^2 - 5y^2 = 15$ is

A. $(2, -3)$

B. $(-2, 1)$

C. $(2, -1)$

D. $(2, 3)$

Answer: A



[Watch Video Solution](#)

5. If $(-3, 4), (k, -2)$ are conjugate points with respect to $2x^2 - 3y^2 = 6$ then $k =$

A. 2

B. 3

C. 4

D. 2

Answer: B



[Watch Video Solution](#)

6. If $2x - ky + 3 = 0$, $3x - y + 1 = 0$ are conjugate lines with respect to $5x^2 - 6y^2 = 15$ then $k =$

A. 2

B. 3

C. 4

D. 6

Answer: D



[Watch Video Solution](#)

7. The locus of poles of tangents to the circle $x^2 + y^2 = a^2$ w.r.t the circle $x^2 + y^2 + 2ax - a^2 = 0$ is

A. $x^2 + 4y^2 = 4a^2$

B. $x^2 - 4y^2 = 4a^2$

C. $4x^2 + y^2 = 4a^2$

D. $4x^2 - y^2 = 4a^2$

Answer: C



Watch Video Solution

8. The locus of poles w.r.t. the parabola $y^2 = 4ax$ of tangents to the hyperbola $4x^2 - 3y^2 = a^2$ is

A. $12x^2 - y^2 = 3a^2$

B. $12x^2 - 3y^2 = a^2$

C. $12x^2 + y^2 = 3a^2$

D. $12x^2 + 3y^2 = a^2$

Answer: C



View Text Solution

9. The locus of poles with respect to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ of tangents to its auxiliary circle is

A. $\frac{x^2}{a^4} + \frac{y^2}{b^4} = \frac{1}{a^2}$

B. $\frac{x^2}{a^4} - \frac{y^2}{b^4} = \frac{1}{a^2}$

C. $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{1}{a^2}$

D. $\frac{x}{a^4} + \frac{y}{b^4} = \frac{1}{a^2}$

Answer: A



[Watch Video Solution](#)

10. The locus of poles of tangents to the circle $x^2 + y^2 = a^2 - b^2$ w.r.t. the hyperbola $x^2/a^2 - y^2/b^2 = 1$ is

A. $\frac{x^2}{a^4} + \frac{y^2}{b^4} = \frac{1}{a^2 - b^2}$

B. $\frac{x^2}{a^4} - \frac{y^2}{b^4} = \frac{1}{a^2 - b^2}$

C. $\frac{x^2}{a^4} + \frac{y^2}{b^4} = \frac{1}{a^2 + b^2}$

$$D. \frac{x^2}{a^4} - \frac{y^2}{b^4} = \frac{1}{a^2 + b^2}$$

Answer: A



[View Text Solution](#)

11. The locus of poles of the lines with respect to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ which touch the parabola $y^2 = 4ax$ is

A. $a^3y^3 + b^4x = 0$

B. $a^2y^2 + b^2x = 0$

C. $a^3y^3 + b^4x = 0$

D. $a^3y^2 - b^4x = 0$

Answer: C



[View Text Solution](#)

12. The locus of poles of the lines with respect to the hyperbola

$x^2/a^2 - y^2/b^2 = 1$ which touch the ellipse $\frac{x^2}{\alpha^2} + \frac{y^2}{\beta^2} = 1$ is

A. $\frac{\alpha^2 x^2}{a^4} + \frac{\beta^2 y^2}{b^4} = 1$

B. $\frac{\alpha^2 x^2}{a^4} - \frac{\beta^2 y^2}{b^4} = 1$

C. $\frac{\alpha^2 x^2}{a^4} + \frac{\alpha^2 y^2}{b^4} = 1$

D. $\frac{\alpha^2 x^2}{a^2} + \frac{\beta^2 y^2}{b^2} = 1$

Answer: A



[View Text Solution](#)

13. The locus of the poles of chords of the parabola $y^2 = 4px$ which

touch the hyperbola $x^2/a^2 - y^2/b^2 = 1$ is

A. $4p^2 x^2 + b^2 y^2 = 4p^2 a^2$

B. $4p^2 x^2 - b^2 y^2 = 4p^2 a^2$

C. $4p^2 x^2 + b^2 y^2 = 4p^2 b^2$

$$D. 4q^2x^2 - b^2y^2 = 4q^2a$$

Answer: A



[View Text Solution](#)

14. Find the locus of the mid-point of the chord of the hyperbola

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 \text{ which subtends a right angle at the origin.}$$

A. $x^2/a^4 + y^2/b^4 = 1/a^2 + 1/b^2$

B. $x^2/a^4 + y^2/b^4 = 1/a^2 - 1/b^2$

C. $x^2/a^4 - y^2/b^4 = 1/a^2 + 1/b^2$

D. $x^2/a^4 - y^2/b^4 = 1/a^2 - 1/b^2$

Answer: A



[Watch Video Solution](#)

15. A straight line touches the circle described on the line joining the foci of the hyperbola $x^2/a^2 - y^2/b^2 = 1$ as diameter . The locus of poles w.r.t. the hyperbola is

A. $\frac{x^2}{a^4} + \frac{y^2}{b^4} = \frac{1}{a^2 + b^2}$

B. $\frac{x^2}{a^4} + \frac{y^2}{b^4} = \frac{1}{a^2 - b^2}$

C. $\frac{x^2}{a^4} - \frac{y^2}{b^4} = \frac{1}{a^2 + b^2}$

D. $\frac{x^2}{a^4} - \frac{y^2}{b^4} = \frac{1}{a^2 - b^2}$

Answer: A



[View Text Solution](#)

16. Chords of the hyperbola $x^2/a^2 - y^2/b^2 = 1$ are at a constant distance k from the centre . The equation to the locus of their poles is

A. $\frac{x^2}{a^4} + \frac{y^2}{b^4} = \frac{1}{k^2}$

B. $\frac{x^2}{a^4} + \frac{y^2}{b^4} = k^2$

$$\text{C. } \frac{x^2}{a^4} + \frac{y^2}{b^4} = \frac{1}{l^4}$$

$$\text{D. } \frac{x^2}{a^4} + \frac{y^2}{b^4} = k^4$$

Answer: A



[View Text Solution](#)

17. If a variable line of slope 4 intersects the hyperbola $xy = 1$ at two points. Then the locus of the point which divides the line segment between these points in the ratio 1 : 2 is

A. $16x^2 + 10xy + y^2 - 2 = 0$

B. $16x^2 - 10xy + 2y^2 - 2 = 0$

C. $16x^2 + 20xy + 10y^2 - 2 = 0$

D. $16x^2 + 15xy + 10y^2 - 2 = 0$

Answer: A



[View Text Solution](#)

18. The chords of contact of P { w.r.t. $x^2 - y^2 = a^2$ and $x^2 + y^2 = a^2$ are at right angles. The locus of P is

A. $x^2 - y^2 = a^2$

B. $x^2 - y^2 = 2a^2$

C. $x^2 - y^2 = 0$

D. $x^2 - y^2 = 1$

Answer: C



[View Text Solution](#)

19. The equation of the chord of the hyperbola $4x^2 - 9y^2 = 36$ having (-2,1) as its mid-point is

A. $8x + 9y + 7 = 0$

B. $8x - 7y + 7 = 0$

C. $8x - 9y - 7 = 0$

D. $6x + 9y + 7 = 0$

Answer: A

 [Watch Video Solution](#)

20. The mid point of the chord $4x-3y=5$ of the hyperbola $2x^2 - 3y^2 = 12$

is

A. $\left(0, -\frac{5}{3}\right)$

B. $(2, 1)$

C. $\left(\frac{5}{4}, 0\right)$

D. $\left(\frac{11}{4}, 2\right)$

Answer: B

 [Watch Video Solution](#)

21. The mid-point of the chord $x + 2y + 4 = 0$ on the hyperbola $3x^2 - 4y^2 = 12$ is

- A. (1, 2)
- B. (2, 3)
- C. (2, - 3)
- D. (2, - 1)

Answer: C



[View Text Solution](#)

22. The locus of the midpoints of the chords $x^2 - y^2 = a^2$ which touch the parabola $y^2 = 4ax$ is

- A. $y^2(X + a) = x^3$
- B. $y^2(x - a) = x^3$
- C. $y^2(x + a) = x^2$

$$D. y^2(x - a) = x^2$$

Answer: B



[View Text Solution](#)

23. The locus of the midpoints of chords of $x^2/a^2 - y^2/b^2 = 1$ which pass through the focus $(ae, 0)$ is

A. $\frac{x^2}{a^2} - \frac{y^2}{b^2} + \frac{xe}{a} = 0$

B. $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{xe}{a} = 0$

C. $\frac{x^2}{a^2} - \frac{y^2}{b^2} - \frac{xe}{a} = 0$

D. $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{xe}{a} = 0$

Answer: C



[View Text Solution](#)

24. The locus of midpoints of chords of the ellipse $x^2/a^2 + y^2/b^2 = 1$ which pass through the positive end of the major axis is

A. $\frac{x^2}{a^2} - \frac{y^2}{b^2} - \frac{x}{b} = 0$

B. $\frac{x^2}{b^2} - \frac{y^2}{a^2} - \frac{x}{a} = 0$

C. $\frac{x^2}{a^2} - \frac{y^2}{b^2} - \frac{x}{a} = 0$

D. $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{x}{a} = 0$

Answer: C



Watch Video Solution

25. A tangents to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ cuts the ellipse $x^2/a^2 + y^2/b^2 = 1$ in P and Q . The locus of midpoint of PQ is

A. $(x^2/a^2 + y^2/b^2)^2 = x^a/a^2 - y^2/b^2$

B. $(x^2/a^2 - y^2/b^2)^2 = x^a/a^2 + y^2/b^2$

C. $(x^2/a^2 + y^2/b^2)^2 = x^a/a^2 + y^2/b^2$

$$D. (x^2/a^2 - y^2/b^2)^2 = x^2/a^2 - y^2/b^2$$

Answer: A



[View Text Solution](#)

26. From points on the circle $x^2 + y^2 = a^2$, tangents are drawn to the hyperbola $x^2 - y^2 = a^2$. The locus of the midpoints of chords of contact is

A. $(x^2 + y^2)^2 = a^2(x^2 - y^2)$

B. $(x^2 - y^2)^2 = a^2(x^2 + y^2)$

C. $a^2(x^2 + y^2)^2 = (x^2 - y^2)$

D. $a^2(x^2 - y^2)^2 = (x^2 + y^2)$

Answer: B



[View Text Solution](#)

27. The locus of the midpoints of chords of the hyperbola

$3x^2 - 2y^2 + 4x - 6 = 0$ which are parallel to $y = 2x$ is

A. $3x - 4y = 4$

B. $3y - 4x = 4$

C. $3x - 4y = 2$

D. $3y - 4x = 2$

Answer: A



[Watch Video Solution](#)

28. The locus of midpoints of chords of the hyperbola $x^2/a^2 - \frac{y^2}{b^2} = 1$

whose poles lie on the auxiliary circle is

A. $\left(\frac{x^2}{a^2} + \frac{y^2}{b^2}\right)^2 = \frac{x^2 + y^2}{a^2}$

B. $\left(\frac{x^2}{a^2} - \frac{y^2}{b^2}\right)^2 = \frac{x^2 + y^2}{a^2}$

C. $\left(\frac{x^2}{a^2} - \frac{y^2}{b^2}\right)^2 = \frac{x^2 - y^2}{a^2}$

$$D. \left(\frac{x^2}{a^2} - \frac{y^2}{b^2} \right)^2 = \frac{x^2 + y^2}{b^2}$$

Answer: B



[View Text Solution](#)

29. Tangents are drawn from $(-2,1)$ to the hyperbola $2x^2 - 3y^2 = 6$. Find their equations.

A. $3x - y + 5 = 0, x - y + 1 = 0$

B. $3x + y + 5 = 0, x + y + 1 = 0$

C. $3x - y - 5 = 0, x - y - 1 = 0$

D. $3x + y - 5 = 0, x + y - 1 = 0$

Answer: A



[Watch Video Solution](#)

30. The equation to the pair of tangents drawn from (1,-2) to the hyperbola $3x^2 - 2y^2 = 6$ is

A. $7x^2 + 4xy - y^2 - 6x - 8y - 5 = 0$

B. $7x^2 - 4xy - 2y^2 - 4x - 7y - 5 = 0$

C. $7x^2 - 4xy - y^2 - 6x - 8y - 5 = 0$

D. $7x^2 + 4xy + y^2 + 6x + 8y + 5 = 0$

Answer: A



[View Text Solution](#)

31. The locus of poles of normal chords of $x^2/a^2 - y^2/b^2 = 1$ is

A. $\frac{a^6}{x^2} + \frac{b^6}{y^2} (a^2 + b^2)^2$

B. $\frac{a^6}{x^2} + \frac{b^6}{y^2} = (a^2 - b^2)^2$

C. $\frac{a^6}{x^2} - \frac{b^6}{y^2} = (a^2 + b^2)^2$

D. $\frac{a^6}{x^2} - \frac{b^6}{y^2} = (a^2 - b^2)^2$

Answer: C



[View Text Solution](#)

32. The locus of middle points of normal chords of the rectangular hyperbola $x^2 - y^2 = a^2$ is

A. $(x^2 + y^2)^2 + 4a^2x^2y^2 = 0$

B. $(x^2 - y^2 + 4a^2x^2y^2 = 0$

C. $(x^2 + y^2)^3 - 4a^2x^2y^2 = 0$

D. $(x^2 - y^2)^2 - 4a^2x^2y^2 = 0$

Answer: B



[View Text Solution](#)

1. One of the foci of the hyperbola is origin and the corresponding directrix is $3x + 4y + 1 = 0$. The eccentricity of the hyperbola is $\sqrt{5}$. The equation of the hyperbola is

- A. only I is true
- B. only II is true
- C. both I and II are true
- D. neither I nor II true

Answer: C



[Watch Video Solution](#)

2. I : If e and e' are the eccentricity of the hyperbola $x^2/a^2 - y^2/b^2 = 1$ and its conjugate hyperbola the value of $1/e^2 + 1/e'^2$ is 1

II : If e and e_1 are the eccentricity of the hyperbola $xy = c^2$, $x^2 - y^2 = c^2$ then $e^2 + e_1^2$ is equal to 4

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II true

Answer: C



View Text Solution

3. The foci of the ellips $\frac{x^2}{16} + \frac{y^2}{b^2} = 1$ and the hyperbola $\frac{x^2}{144} - \frac{y^2}{81} = \frac{1}{25}$ coincide ,then the value of b^2 is

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II true

Answer: C



[Watch Video Solution](#)

4. I : The angle between the asymptotes of the hyperbola

$$x^2 - 3y^2 = 3 \text{ is } \pi/3$$

II: The angle between the asymptotes of the hyperbola $xy = c^2$ is $\pi/2$

- A. only I is true
- B. only II is true
- C. both I and II are true
- D. neither I nor II true

Answer: C



[View Text Solution](#)

1. IF the equation of the hyperbola whose focus is (2,4) eccentricity is 5 and directrix is $4x - 3y + 1 = 0$ is $15x^2 - 24xy + 8y^2 + ax + by + c = 0$ then the ascending order of a,b,c is

A. a,b,c

B. b,c,a

C. c,a,b

D. c,b,a

Answer: D



[View Text Solution](#)

2. The equation of the normal to the hyperbola $x^2 - 4y^2 = 5at(3, - 1)$ is

A. a,b,c

B. b,c,a

C. c,a,b

D. c,b,a

Answer: D



[Watch Video Solution](#)

3. The equation of the tangent to the hyperbola $3x^2 - 2y^2 = 10a$ at $(2, 1)$ is

A. a,b,c

B. b,c,a

C. c,a,b

D. c,b,a

Answer: D



[Watch Video Solution](#)

4. The equation of one asymptote of the hyperbola $14x^2 + 38y + 20y^2 + x - 7y - 91 = 0$ is $7x + 5y - 3 = 0$. Then the other asymptote is

A. a,b,c

B. b,c,a

C. c,a,b

D. c,b,a

Answer: B



Watch Video Solution

Set 3

Hyperbola point

Centre

- | | | |
|--------------|------------------------------------|-------------------|
| <i>I</i> | $4(x + 3)^2 - 9(y - 2)^2 = 36,$ | <i>(a)</i> (2,-1) |
| 1. <i>II</i> | $3(x - 3)^2 - 4(y - 1)^2 = 12,$ | <i>(b)</i> (-3,2) |
| <i>III</i> | $9(x - 2)^2(2) - 5(y - 1)^2 = 45,$ | <i>(c)</i> (2, 1) |
| <i>IV</i> | $x^2 - 4x - y^2 - 2y - 8 = 0,$ | <i>(d)</i> (3,1) |

A. a,b,c,d

B. b,d,c,a

C. c,a,b,d

D. b,c,d,a

Answer: B



[Watch Video Solution](#)

Hyperbola

Foci

- | | | |
|--------------|---|--|
| <i>I</i> | $\frac{(x-1)^2}{16} - \frac{(y-2)^2}{9} = 1$ | <i>(a)</i> (1,-1)(-9,-1) |
| 2. <i>II</i> | $\frac{(x+2)^2}{9} - \frac{(y-3)^2}{27} = 1$ | <i>(b)</i> (6,2)(-4,2) |
| <i>III</i> | $\frac{(x+1)^2}{25} - \frac{(y+2)^2}{16} = 1$ | <i>(c)</i> (4,3)(-8,3) |
| <i>IV</i> | $9x^2 - 4y(2) = 8, (2, -)$ | <i>(d)</i> $\left(-1 \pm \sqrt{41}, -2\right)$ |

A. a,b,c,d

B. a,d,b,c

C. c,a,b,d

D. b,c,d,a

Answer: D



View Text Solution

Hyperbola point

tangent

I $3x^2 - 4y^2 = 12, 3x + 2y + 6 = 0$

(a) (2,-3)

3. *II* $x^2 - 3y^2 = 3, 2x + y - 1 = 0$

(b) (-1,-3)

III $3x^2 - 4y^2 = 8, (2, -1)$

(c) $x + 2y - 4 = 0$

IV $9x^2 - 16y^2 = 144, 3x - 16y + 48 = 0$

(d) (6,-1)

A. a,b,c

B. b,c,a

C. c,b,a

D. a,c,b

Answer: B



View Text Solution

Hyperbola point

Pole

- | | | |
|--------------|---|------------|
| <i>I</i> | $3x^2 - 4y^2 = 12 - 3x + 2y + 6 = 0,$ | (a)(2,-3) |
| 4. <i>II</i> | $x^2 - 3y^2 = 32x + y - 1 = 0,$ | (b)(-1,-3) |
| <i>III</i> | $3x^2 - 5y^2 = 15 - 2x + 5y - 5 = 0,$ | (c)(-2, 1) |
| <i>IV</i> | $9x^2 - 16y^2 = 144 - 3x - 16y + 48 = 0,$ | (d)(6,-1) |

A. a,b,c,d

B. a,b,d,c

C. c,d,a,b

D. b,c,d,a

Answer: C



View Text Solution

5.

Equation of the curve

Nature of the curve

I $x = 2(\cos t + \sin t)y = 5(\cos t - \sin t),$

(a)(Parabola)

II $x = 3(\cosh \theta + \sin h\theta)y = (4 \cos h\theta - \sin h\theta),$

(b)(ellipse)

III $x = \sin^2 ty = 2 \cos t,$

(c)(hyperbola)

A. a,b,c

B. b,c,a

C. c,b,a

D. a,c,b

Answer: B



[View Text Solution](#)

Set 4

1. A : The foci of the hyperbola $\frac{(x + 2)^2}{9} - \frac{(y - 3)^2}{27} = 1$ are (4,3) ,(-8,3).

R : The foci of the hyperbola $\frac{(x - \alpha)^2}{a^2} - \frac{(y - \beta)^2}{b^2} = 1$ are $(\alpha \pm ae, \beta)$

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A



Watch Video Solution

2. A : The equation of the normal to the hyperbola

$$x^2 - 4y^2 = 5 \text{ at } (3, -1) \text{ is } 4x - 3y = 15$$

R : The equation of the normal to the hyperbola

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 \text{ at } (x_1, y_1) \text{ is } \frac{a^2 x}{x_1} + \frac{b^2 y}{y_1} = a^2 + b^2$$

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A



Watch Video Solution

3. A : If $(-3,4)$, $(k,-2)$ are conjugate points with respect to the hyperbola

$$2x^2 - 3y^2 = 6 \text{ then } k = 3$$

R : The points $(x_1, y_1), (x_2, y_2)$ are conjugate with respect to $S = 0$ iff

$$S_{12} = 0$$

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is not correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

Answer: A



Watch Video Solution

4. A : The angle between the asymptotes $x^2 - y^2 = 2$ is $\pi/2$

R: The angle between the asymptotes of the hyperbola

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 \text{ is } 2 \frac{\tan^{-1}(b/a)}{a}$$

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is not correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

Answer: A



Watch Video Solution