# 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**

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**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**

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**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**

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**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**

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

A. a parabola

B. an elipse

C. a circle

D. a rectangular hyperbola

**Answer: 4**

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**6.** The conditon 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**

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**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. $a1b_2 = a_2 b_1$

C. $a_1 b_2 + a_2 b_1 = 0$

D. $a_1 a_2 + b_1 b_2 = 0$

**Answer: 4**

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

A. a circle

B. a parabola

C. an elipse

D. a hyperbola

**Answer: 4**

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**9.** The coordinates of a point are $(4\tan\phi, 3\sec\phi)$ where $\phi$ 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**

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**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**

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**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**

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## Exercise 1 A

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

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

B. $xy = 1$

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

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

**Answer: C**

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**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. $8x^2 + 9y^2 - 24xt + 6x + 8y + 1 = 0$

**Answer: A**

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**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**

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**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**

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**5.** The equation of the hyperbola with is axes coordinates axes , whose tranverse axis 8 and eccentricity 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**

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**6.** The equation of the hyperbola with is 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**

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**7.** The equation of the heyperbola 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**

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

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**9.** The equation of the hyperbola whose centre is (1,2). One focus is (6,2) and trans verse 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**

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**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**

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**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**

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**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**

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**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**

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**14.** The equation of the transverse and cojugate axes of a hyperbola are respectively $x + 2y - 3 = 0, 2x - y + 4 = 0$ and their respectively length 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. $\frac{2}{5}(2x - y + 3)^2 \frac{3}{5}(x + 2y - 3)^2 = 1$

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**

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**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**

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

A. $(5, 3), (-1, 3)$

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

C. $(-5, 3), (-1, -3)$

D. $(5, 3), (1, 3)$

**Answer: A**

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**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**

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

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

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

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

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

**Answer: B**

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**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**

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**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**

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**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**

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**22.** The length of the transverse axis of the hyperbola $4x^2 - 9y^2 + 8x + 40 = 0$ is

A. 4

B. 6

C. $2\sqrt{3}$

D. $4\sqrt{2}$

**Answer: A**

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**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**

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**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**

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**25.** The length of the latus rectum of the hyperbola $9x^2 - 16y^2 + 72x - 32y - 16 = 0$ is

A. $9/2$

B. $32/3$

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

D. $21/5$

**Answer: A**

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**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**

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**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**

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**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**

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**29.** The eccentricity of the rectangular hyperbola is

A. e

B. $\in fity$

C. $\sqrt{2}$

D. $4\sqrt{3}$

**Answer: C**

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**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**

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**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**

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**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**

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**33.** If e and e' are the ecentricity 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**

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**34.** If e1 and e2 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**

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**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**

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**36.** If e and $e_1$ are the eccentricities of the hyperbola $xy = c^2, x^2 - y^2 = c^2 \text{thene}^2 + e_1^2$ is equal to

A. 1

B. 4

C. 6

D. 8

**Answer: B**

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**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**

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**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**

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**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**

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

**Answer: C**

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**41.** If the latus rectum of a hyperbola forms an equilateral triangle with the vertex at the centre of the hyperbola , then its accentricity 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**

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

A. $\sqrt{2}$

B. $\sqrt{3}$

C. $\sqrt{5}$

D. $\sqrt{6}$

**Answer: B**

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

A. 4

B. $\sqrt{3}$

C. 2

D. $\sqrt{2}$

**Answer: C**

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**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**

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

A. $\sqrt{3}$

B. $\sqrt{3}+1$

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

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

**Answer: D**

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**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**

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**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**

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**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**

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**49.** The equations of the latus recta of the hyperbola $9x^2 - 16y^2 - 18x - 32y - 151 = 0$ 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**

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**50.** The equation of the conjugate axis of the hyperbola $\frac{(x-5)^2}{16} - \frac{(y-4)^2}{9} = 1$ is

A. $y - 4 = 0$

B. $y - 6 = 0$

C. $y + 8 = 0$

D. $y - 2 = 0$

**Answer: A**

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**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**

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**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**

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**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**

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**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 retio $a^2, b^2$ then NQ is

A. perpendicular to A'P

B. Parallel to A'P

C. perpendicular to OP

D. none

**Answer: A**

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**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**

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**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**

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

A. Eccentricity

B. Directrix

C. Abscissae of vertices

D. Abscissae of foci

**Answer: D**

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**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**

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

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

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

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

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

**Answer: A**

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**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**

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

A. $1, \ -3$

B. $1, \ -3/2$

C. $2, \ -3/2$

D. $3, \ -2/2$

**Answer: B**

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

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

**Answer: A**

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**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**

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

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**

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**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**

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**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**

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**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**

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**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**

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**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**

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**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**

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**71.** The equations of the tangents to the hyperbola $4x^2 - 5y^2 = 20$ which make an angle $60^\circ$ 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**

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**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**

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**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**

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**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**

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**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. $mim_2 = 11/20$

**Answer: A**

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**76.** The equations of the direcrtor cirlce 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**

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**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**

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**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**

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**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**

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**80.** The locus of the point of interection of two tangents of the hyperbola $x^2/a^2 - y^2/b^2 = 1$which make an angle $30^\circ$ with one another is

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

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

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

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

**Answer: A**

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**81.** The locus of the point of interection of two tangents of the hyperbola $x^2/a^2 - y^2/b^2 = 1$which make an angle$45^\circ$ with one another is

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

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

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

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

**Answer: B**

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**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 $90^\circ$ 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**

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**83.** Tangents to the hyperbola $x^2/a^2 - y^2/b^2 = 1$ make angle $\theta_1, \theta_2$ with the transverse axis .if $\theta_1, \theta_2$ are complementary then the locus of the point of intcrsection 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**

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

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

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

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

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

**Answer: C**

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

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

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

C. $k\left(x^2+a^2=2xy\right.$

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

**Answer: B**

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**86.** Tangents drawn from $(\alpha,\beta)$ to the hyperbola $x^2/a^2-y^2/b^2=1$ make angles $\theta_1$ and $\theta_2$ 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**

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

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

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

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

D. $\left(x^2 + y^2\right)^2 = 4a^2\Big)\left(x^2 + y^2 - a^2\right)$

**Answer: C**

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**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. $\left(x^4 + y^4\right) = a^6$

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

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

D. none

**Answer: B**

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**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**

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**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 $\alpha$ and $\beta$ 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**

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**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. $y = \pm x \pm \left(a^2 - b^2\right)$

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

**Answer: B**

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**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**

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**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**

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**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. $\left(x^2 + y^2\right)^2 = a^2x^2 + b^2y^2$

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

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

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

**Answer: B**

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**95.** The equation to the pair of asymptotes of the hyperbola $2x^2 - y^2 = 1$ is

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

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

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

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

**Answer: B**

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**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**

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**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**

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**98.** The angles between the asymptotes of the hyperbola $x^2/a^2 - y^2/b^2 = 1$is

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

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

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

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

**Answer: D**

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**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**

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**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**

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**101.** The combined equation of the asymptotes of the hyperbola $xy + x + y + 5 = 0$ is

A. $xy = 0$

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

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

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

**Answer: D**

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**102.** The asymptotes of the hyperbola $6x^2 + 13xy + 6y^2 - 7x - 8y - 26 = 0$ 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**

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**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**

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**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**

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**105.** The equation of the hyperbola which passes through the point $(2, 3)$ and has the asymptotes $4x + 3y - 7 = 00$ 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**

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**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**

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**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**

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**108.** The assymptotes 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**

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**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**

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

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

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

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

**Answer: C**

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**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**

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**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**

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**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**

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**114.** The product of lenghts 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**

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**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**

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**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**

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

A. $(a, a)$

B. $(b, a)$

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

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

**Answer: D**

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

A. Director circle

B. Auxilary circle

C. Circle on SS as diameter

D. none

**Answer: B**

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**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**

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**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 heyperbola is

A. $\sqrt{2}$

B. $\sqrt{3}$

C. $1/\sqrt{3}$

D. $2\sqrt{3}$

**Answer: B**

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**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**

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**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**

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**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**

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**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**

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**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**

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**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 $(\alpha, \beta)$ 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**

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

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

D. none

**Answer: A**

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**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. $a^2x^2 + b^2y^2 = \left(a^2 + b^2\right)^2$

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

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

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

**Answer: B**

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

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

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

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

D. none

**Answer: A**

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**130.** If $\alpha$ and $\beta$ 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**

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**131.** If the axes are rotated through an angle of $45^\circ$ 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**

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**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**

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**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**

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

A. parabola

B. ellipse

C. hyperbola

D. none

**Answer: A**

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**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**

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

A. parabola

B. ellipse

C. hyperbola

D. none

**Answer: C**

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

A. a circle

B. a parabola

C. an elipse

D. a hyperbola

**Answer: B**

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

A. a hyperbola if $k<8$

B. an elipse if $k>8$

C. a hyperbola if $8<k$

D. none

**Answer: C**

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**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 elipse

C. a hyperbola

D. a branch of a hyperbola

**Answer: C**

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**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**

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**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 elipse

D. a hyperbola

**Answer: C**

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**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 elipse

C. a parabola

D. a circle

**Answer: A**

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**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 og sine graph

D. a part of a hyperbola

**Answer: B**

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**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 elipse

C. a hyperboa

D. none

**Answer: C**

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**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 elipse

C. a parabola

D. a hyperbola

**Answer: C**

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**146.** Chords of an elipse are drawn through the positive end of minor axis . Then their midpoint lies on

A. a circle

B. a parabola

C. an elipse

D. a hyperbola

**Answer: C**

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**147.** The locus of the point represented by $x = 1 + 4\cos\theta, y = 2 + 3\sin\theta$ is

A. an elipse

B. a parabola

C. a hyperbola

D. a circle

**Answer: A**

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## 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**

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**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**

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**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**

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**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**

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**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**

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**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**

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**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**

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**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**

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**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**

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**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**

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**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**

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**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 elipse $\frac{x^2}{\alpha^2} + \frac{y^2}{\beta^2} = 1$ 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**

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

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

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

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

**Answer: A**

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**14.** Find the locus of the mid-point of the chord of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ 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**

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**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**

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**16.** Chords of he 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. $\frac{x^2}{a^4} + \frac{y^2}{b^4} = k^2$

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

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

**Answer: A**

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**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**

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**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**

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**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**

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**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**

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**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**

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

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**

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**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**

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**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**

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

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

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

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

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

**Answer: A**

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**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. $\left(x^2 + y^2\right)^2 = a^2\left(x^2 - y^2\right)$

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

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

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

**Answer: B**

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**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**

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**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**

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**29.** Tangents are drawn from (-2,1) to the hyperola $2x^2-3y^2=6$. 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**

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**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**

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**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**

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

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

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

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

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

**Answer: B**

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Set 1

**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 ture

D. neither I nor II true

**Answer: C**

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**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 $xy = c^2, x^2 - y^2 = c^2$ $\text{then} e^2 + c_1^2$ is equal to 4

A. only I is true

B. only II is true

C. both I and II are ture

D. neither I nor II true

**Answer: C**

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**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 ture

D. neither I nor II true

**Answer: C**

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**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 $xy = c^2 \text{is} \pi / 2$

A. only I is true

B. only II is true

C. both I and II are ture

D. neither I nor II true

**Answer: C**

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Set 2

**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**

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**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**

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

A. a,b,c

B. b,c,a

C. c,a,b

D. c,b,a

**Answer: D**

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**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**

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Set 3

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

A. a,b,c,d

B. b,d,c,a

C. c,a,b,d

D. b,c,d,a

**Answer: B**

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

A. a,b,c,d

B. a,d,b,c

C. c,a,b,d

D. b,c,d,a

**Answer: D**

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| | | Hyperbola point | tangent |
|---|---|---|---|
| 3. | $I$ | $3x^2 - 4y^2 = 12, 3x + 2y + 6 = 0$ | $(a)(2,-3)$ |
| | $II$ | $x^2 - 3y^2 = 3, 2x + y - 1 = 0$ | $(b)(-1,-3)$ |
| | $III$ | $3x^2 - 4y^2 = 8, (2, -1)$ | $(c)x + 2y - 4 = 0$ |
| | $IV$ | $9x^2 - 16y^2 = 144, 3x - 16y + 48 = 0$ | $(d)(6,-1)$ |

A. a,b,c

B. b,c,a

C. c,b,a

D. a,c,b

**Answer: B**

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

A. a,b,c,d

B. a,b,d,c

C. c,d,a,b

D. b,c,d,a

**Answer: C**

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**5.**

| | Equation of the curve | Nature of the curve |
|---|---|---|
| $I$ | $x = 2(\cos t + \sin t) y = 5(\cos t - \sin t),$ | $(a)$(Parabola) |
| $II$ | $x = 3(\cosh \theta + \sin h\theta) y = (4 \cos h\theta - \sin h\theta),$ | $(b)$(elipse) |
| $III$ | $x = \sin^2 t y = 2 \cos t,$ | $(c)(hyperbola)$ |

A. a,b,c

B. b,c,a

C. c,b,a

D. a,c,b

**Answer: B**

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## 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**

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**2.** A : The eqution of the normal to the hyperbola $x^2 - 4y^2 = 5at(3, -1)is4x - 3y = 15$

R : The equation of the normal to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1at(x_1, y_1)\text{is}\frac{a^2x}{x_1} + \frac{b^2y}{y_1} = a^2 + b^2$

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**

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**3.** A : If (-3,4) ,(k,-2) are conjugate points with respect to the hyperbola $2x^2 - 3y^2 = 6 \text{then} \quad k = 3$

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**

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

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. 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**

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