MATHS

BOOKS - DISHA PUBLICATION MATHS (HINGLISH)

CONIC SECTIONS

Jee Main 5 Years At A Glance

1. If the tangent at (1,7) to curve $x^2 = y - 6$ touches the circle $x^2 + y^2 + 16x + 12y + c = 0$ then the value of c is

A. 185

B. 85

C. 95

D. 195

Answer: C

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2. Tangent and normal are drawn at P(16,16) on the parabola $y^2 = 16x$ which intersect the axis of the parabola at A and B respectively. If C is the centre of the circle through the points P,A and B and $\angle CPB = \theta$ then the value of $\tan\theta$ is

A. 2

B. 3

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

D. $\frac{1}{2}$

Answer: A

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3. Two sets A and B are as under $A = |(a, b) \in R \times R : |a - 5| < 1$ and $|b - 5| < 1\}B = [(a, b) \in R \times R$

(1) $B \subset A$ (2) $A \subset B$ (3) $A \cap B = \phi(anemptyset)(4) \neq itherA$ sub B n or B sub A`

A. $A \subset B$

B. $A \cap B = \phi$ (an empty set)

C. neither $A \subset B$ nor $B \subset A$

D. $B \subset A$

Answer: A

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4. Tangents are drawn to the hyperbola $4x^2 - y^2 = 36$ at the points P and Q. If these tangents intersect at the point T(0,3) then the area (in sq units) of $\triangle PTQ$ is

A. $54\sqrt{3}$

B. $60\sqrt{3}$

C. $36\sqrt{3}$

D. $45\sqrt{3}$

Answer: D

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5. If a circle C, whose radius is 3, touches externally the circle, $x^2 + y^2 + 2x - 4y - 4 = 0$ at the point (2,2) ,then the length of intercept cut by this circle C, the x-axis is equal to :

A. $\sqrt{5}$

B. $2\sqrt{3}$

C. $3\sqrt{2}$

D. $2\sqrt{5}$

Answer: D

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6. v20.1

A. $\frac{1}{2}$

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

C. $\frac{1}{9}$

D. $\frac{1}{3}$

Answer: D

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7. The locus of the point of intersection of the lines, $\sqrt{2}x - y + 4\sqrt{2}k = 0$ and $\sqrt{2}kx + ky - 4\sqrt{2} = 0$ (k is any non-zero real parameter), is:

A. A hyperbola with length of its transverse axis $8\sqrt{2}$

B. An ellipse with length of its major axis $8\sqrt{2}$

C. An eliipse whose eccentricity $\frac{1}{\sqrt{3}}$

D. A hyperbola whose eccentricity is $\sqrt{3}$

Answer: A

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8. The radius of a circle, having minimum area, which touches the curve $y = 4 - x^2$ and the lines y=|x|, is

A. $4\left(\sqrt{2}+1\right)$

B. $2\left(\sqrt{2}+1\right)$

C. $2\left(\sqrt{2}-1\right)$

D. $4\left(\sqrt{2}-1\right)$

Answer:

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9. A hyperbola passes through the point $P(\sqrt{2}, \sqrt{3})$ and has foci at $(\pm 2, 0)$. Then the tangent to this hyperbola at P also passes through the point : $(\sqrt{3}, \sqrt{2})$ (2) $(-\sqrt{2}, -\sqrt{3})$ (3) $(3\sqrt{2}, 2\sqrt{3})$ (4) $(2\sqrt{2}, 3\sqrt{3}$

A. $(-\sqrt{2}, -\sqrt{3})$

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

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

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

Answer: C

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10. Let $z \in C$, the set of complex numbers. Thenthe equation, $2|z + 3i| - |z - i| = 0$ represents :

A. a circle with radius $\frac{8}{3}$.

B. a circle with diameter $\frac{10}{3}$.

C. an ellipse with length of major axis $\frac{16}{3}$.

D. an ellipse with length of minor axis $\frac{16}{9}$

Answer: A

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11. If a point P has co-ordinates $(0, -2)$ and Q is any point on the circle $x^2 + y^2 - 5x - y + 5 = 0$, then the maximum value of $(PQ)^2$ is : (a) $\frac{25+\sqrt{6}}{2}$ (b) $14 + 5\sqrt{3}$ (c) $\frac{47+10\sqrt{6}}{2}$ (d) $8 + 5\sqrt{3}$

A. $\frac{25+\sqrt{6}}{2}$

B. $14 + 5\sqrt{3}$

C. $\frac{47+10\sqrt{6}}{2}$

D. $8 + 5\sqrt{3}$

Answer: B

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12. If two parallel chords of a circle, having diameter 4 units, lie on the opposite sides of the centreand subtend angles $\cos^{-1}\left(\frac{1}{7}\right)$ and $\sec^{-1}(7)$ at the centre respectively, then the distance betweenthese chords, is: (a) $\frac{4}{\sqrt{7}}$ (b) $\frac{8}{\sqrt{7}}$ (c) $\frac{8}{7}$ (d) $\frac{16}{7}$

A. $\frac{4}{\sqrt{7}}$

B. $\frac{8}{\sqrt{7}}$

C. $\frac{8}{7}$

D. $\frac{16}{7}$

Answer: B

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13. If the common tangents to the parabola $x^2 = 4y$ and the circle $x^2 + y^2 = 4$ intersectat the point P, then the distance of P from the origin, is.

A. $\sqrt{2}+1$

B. $2\left(3+2\sqrt{2}\right)$

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

D. $3+2\sqrt{2}$

Answer: C

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14. Consider an ellipse, whose centre is at the origin and its major axis is along the x-axis. If its eccentricity is and the $\frac{3}{5}$distance between its foci is 6, then the area (in sq, units) of the quadrilateral inscribed in the ellipse, with the vertices as the vertices of the ellipse, is :

A. 8

B. 32

C. 80

D. 40

Answer: D

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15. The locus of the point of intersection of thestraight lines $tx - 2y - 3t = 0, x - 2ty + 3 = 0 (t \in R,$ is

A. an ellipse with eccentricity $\frac{2}{\sqrt{5}}$

B. an ellipse with the length of major axis 6

C. a hyperbola with eccentricity $\sqrt{5}$

D. a hyperbola with the length of conjugate axis 3

Answer: D

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16. If one of the diameters of the circle, given by the equation, $x^2 + y^2 - 4x + 6y - 12 = 0$, is a chord of a circle S, whose centre is at

$(-3, 2)$, then the radius of S is : (1) $5\sqrt{2}$ (2) $5\sqrt{3}$ (3) 5 (4) 10

A. 5

B. 10

C. $5\sqrt{2}$

D. $5\sqrt{3}$

Answer: D

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17. Let P be the point on the parabola, $y^2 = 8x$ which is at a minimum distance from the centre C of the circle,$x^2 + (y+6)^2 = 1$. Then the equation of the circle, passing through C and having its centre at P is : (1) $x^2 + y^2 - 4x + 8y + 12 = 0$ (2) $x^2 + y^2 - x + 4y - 12 = 0$ (3) $x^2 + y^2 - \frac{x}{4} + 2y - 24 = 0$ (4) $x^2 + y^2 - 4x + 9y + 18 = 0$

A. $x^2 + y^2 - \frac{x}{4} + 2y - 24 = 0$

B. $x^2 + y^2 - 4x + 9y + 18 = 0$

C. $x^2 + y^2 - 4x + 8y + 12 = 0$

D. $x^2 + y^2 - x + 4y - 12 = 0$

Answer: C

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18. The eccentricity of the hyperbola whose length of the latus rectum is equal to 8 and the length of its conjugate axis is equal to half of the distance between its foci, is : (1) $\frac{4}{3}$ (2) $\frac{4}{\sqrt{3}}$ (3) $\frac{2}{\sqrt{3}}$ (4) $\sqrt{3}$

A. $2\sqrt{3}$

B. $\sqrt{3}$

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

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

Answer: A

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19. A circle passes through $(-2, 4)$ and touches y-axis at $(0, 2)$. Which one of following equations can represents diameter of the circle? 1) $4x + 5y - 6 = 0$ 2) $2x - 3y + 10 = 0$ 3) $3x + 4y - 3 = 0$ 4) $5x + 2y + 4 = 0$

A. 2x - 3y + 10 = 0

B. 3x + 4y - 3 = 0

C. 4x + 5y - 6 = 0

D. 5x + 2y + 4 = 0

Answer: A

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20. If the tangent at a point on the ellipse $\frac{x^2}{27} + \frac{y^2}{3} = 1$ meets the coordinate axes at A and B, and the origin, then the minimum area (in sq. units) of the triangle OAB is:

A. $3\sqrt{3}$

B. $\frac{9}{2}$

C. 9

D. $\frac{9}{\sqrt{3}}$

Answer: C

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21. Let a and b respectively be the semi-transverse and semi-conjugate axes of a hyperbola whose eccentricity satisfies the equation $9e^2 - 18e + 5 = 0$. If $S(5, 0)$ is a focus and $5x = 9$ is the corresponding directrix of this hyperbola, then $a^2 - b^2$ is equal to

A. -7

B. -5

C. 5

D. 7

Answer: A

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22. Locus of the image of the point (2, 3) in the line $(2x - 3y + 4) + k(x - 2y + 3) = 0, k\varepsilon R$, is a : (1) straight line parallel to x-axis. (2) straight line parallel to y-axis (3) circle of radius $\sqrt{2}$ (4) circle of radius $\sqrt{3}$

A. circle of radius $\sqrt{2}$.

B. circle of radius $\sqrt{3}$.

C. straight line parallel to x-axis

D. straight line parallel to y-axis

Answer: A

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23. The number of common tangents to the circles $x^2 + y^2 - 4x - 6y - 12 = 0$ and $x^2 + y^2 + 6x + 18y + 26 = 0$, is

A. 3

B. 4

C. 1

D. 2

Answer: A

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24. Let O be the vertex and Q be any point on the parabola,$x^2 = 8y$. It the point P divides the line segment OQ internally in the ratio 1 : 3, then the locus of P is : (1) $x^2 = y$ (2) $y^2 = x$ (3) $y^2 = 2x$ (4) $x^2 = 2y$

A. $y^2 = 2$

B. $x^2 = 2Y$

C. $x^2 = y$

D. $y^2 = x$

Answer: B

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25. The area (in sq. units) of the quadrilateral formed by the tangents at the end points of the latera recta to the ellipse $\frac{x^2}{9} + \frac{y^2}{5} = 1$, is: (1) $\frac{27}{4}$ (2) 18 (3) $\frac{27}{2}$ (4) 27

A. $\frac{27}{2}$

B. 27

C. $\frac{27}{4}$

D. 18

Answer: B

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26. Tangents are drawn to $x^2 + y^2 = 16$ from the point $P(0, h)$. These tangents meet the $x - a\xi s$ at $AandB$. If the area of triangle PAB is minimum, then $h = 12\sqrt{2}$ (b) $h = 6\sqrt{2}$ $h = 8\sqrt{2}$ (d) $h = 4\sqrt{2}$

A. $4\sqrt{2}$

B. $3\sqrt{3}$

C. $3\sqrt{2}$

D. $4\sqrt{3}$

Answer: A

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27. If $y + 3x = 0$ is the equation of a chord of the circle, $x^2 + y^2 - 30x = 0$, then the equation of the circle with this chord as diameter is:

A. $x^2 + y^2 + 3x + 9y = 0$

B. $x^2 + y^2 + 3x - 9y = 0$

C. $x^2 + y^2 - 3x - 9y = 0$

D. $x^2 + y^2 - 3x + 9y = 0$

Answer: D

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28. Let C be the circle with centre at (1, 1) and radius = 1. If T is the circle centred at (0, y), passing through origin and touching the circle C externally, then the radius of T is equal to (1) $\frac{\sqrt{3}}{\sqrt{2}}$ (2) $\frac{\sqrt{3}}{2}$ (3) $\frac{1}{2}$ (3) $\frac{1}{4}$

A. $\frac{1}{2}$

B. $\frac{1}{4}$

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

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

Answer: B

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29. The slope of the line touching both the parabolas $y^2 = 4x$ and $x^2 = -32y$ is (a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) $\frac{1}{8}$ (d) $\frac{2}{3}$

A. $\frac{1}{8}$

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

C. $\frac{1}{2}$

D. $\frac{3}{2}$

Answer: C

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30. The locus of the foot of prependicular drawn from the center of the ellipse $x^2 + 3y^2 = 6$ on any tangent to it is

A. $\left(x^2 + y^2\right)^2 = 6x^2 + 2y^2$

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

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

D. $\left(x^2-y^2\right)^2=6x^2-2y^2$

Answer: A

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31. The circle $x^2+y^2-6x-10y+k=0$ does not touch or intersect the coordinate axes, and the point (1, 4) is inside the circle. Find the range of value of k.

A. (0, 25)

B. (25, 39)

C. (9,25)

D. (25, 29)

Answer: D

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32. Let a & b be any two numbers satisfying $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{4}$.Then, the foot of the perpendicular from the origin on variable line $\frac{x}{a}+\frac{y}{b}=1$ lies on

A. a hyperbola with each semi-axis = $\sqrt{2}$

B. a hyperbola with each semi-axis = 2

C. a circle of radius = 2

D. a circle of radius = $\sqrt{2}$

Answer: C

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33. If the circle whose diameter is the major axis of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1(a>b>0)$ meets the minor axis at point P and the orthocentre of ΔPF_1F_2 lies on the ellipse, where F_1 and F_2 are foci of the ellipse, then the square of the eccentricity of the ellipse is

A. $\frac{1}{2}$

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

C. $\frac{1}{2\sqrt{2}}$

D. $\frac{1}{4}$

Answer: C

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Exercise 1 Concept Builder Topicwise 1

1. If the $y = mx + 1,$ of the circle $x^2 + y^2 = 1$ subtends an angle of measure 45° of the major segment of the circle then value of m is -

A. $2 \pm \sqrt{2}$

B. $-2 \pm \sqrt{2}$

C. $-1 \pm \sqrt{2}$

D. $-2 \pm \sqrt{2}$

Answer: C

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2. Point $(1, 2)$ relative to the circle $x^2 + y^2 + 4x - 2y - 4 = 0$is a/an

A. exterior point

B. interior point, but not centre

C. boundary point

D. centre

Answer: A

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3. Let PQ and RS be tangents at the extremities of the diameter PR of a circle of radius r. If PS and RQ intersect at a point X on the circumference of the circle, then 2r equals

A. $\sqrt{PQ.RS}$

B. $(PQ+RS)^2$

C. $2PQ.R\dfrac{S}{PQ+RS}$

D. $\sqrt{\left(PQ^2+RS^2\right)^{/2}}$

Answer: A

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4. Find the equation of the circle having the lines $x^2+2xy+3x+6y=0$ as its normal and having size just sufficient to contain the circle $x(x-4)+y(y-3)=0$

A. $x^2+y^2+3x-6y-40=0$

B. $x^2+y^2+6x-3y-45=0$

C. $x^2+y^2+8x+4y-20=0$

D. $x^2+y^2+4x+8y+20=0$

Answer: B

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5. Let A be the centre of the circle $x^2 + y^2 - 2x - 4y - 20 = 0$ .The tangents at the points B(1,7) and C(4,-2) on the circle meet at the point D .If Δ denotes the area of the quadrilateral ABCD,then $\frac{\Delta}{25}$ is equal to

A. 150

B. 75

C. $75/2$

D. None of these

Answer: B

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6. The locus of the centre of a circle which touches externally the circle $x^2 + y^2 - 6x - 6y + 14 = 0$ and also touches Y-axis, is given by the equation

A. $x^2 - 6x - 10y + 14 = 0$

B. $x^2 - 10x - 6y + 14 = 0$

C. $y^2 - 6x - 10y + 14 = 0$

D. $y^2 - 10x - 6y + 14 = 0$

Answer: D

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7. Tangents are drawn from the point (h,k) to ^circle $x^2 + y^2 = a^2$; Prove that the area of the triangle formed by them and the straight line joining their point of contact is $\frac{a\left(h^2 + k^2 - a^2\right)^{\frac{3}{2}}}{h^2 + k^2}$

A. $\frac{\left(h^2 + k^2 - a^2\right)^{3/2}}{h^2 + k^2}$

B. $\frac{\left(h^2+k^2-a^2\right)^{1/2}}{h^2+k^2}$

C. $\frac{\left(h^2+k^2-a^2\right)^{3/2}}{h^2+k^2}$

D. $\frac{\left(h^2+k^2-a^2\right)^{1/2}}{h^2+k^2}$

Answer: A

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8. The parametric equations of the circle $x^2+y^2+mx+my=0$ are

A. $x=-\frac{m}{2}+\frac{m}{\sqrt{2}}\cos\theta, y=\frac{m}{2}+\frac{m}{\sqrt{2}}\sin\theta$

B. $x=-\frac{m}{2}+\frac{m}{\sqrt{2}}\cos\theta, y=-\frac{m}{2}+\frac{m}{\sqrt{2}}\sin\theta$

C. x = 0 , y = 0

D. None of the above

Answer: B

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9. If a line segement $AM = a$ moves in the plane XOY remaining parallel to OX so that the left endpoint A slides along the circle $x^2 + y^2 = a^2$, then the locus of M.

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

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

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

D. $x^2 + y^2 - 2ax - 2ay = 0$

Answer: B

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Exercise 1 Concept Builder Topicwise 2

1. The point $\begin{pmatrix} P+1 \\ P \end{pmatrix}$ (where [.] denotes the greatest integer function), lyinginside the region bounded by the circle $x^2 + y^2 - 2x - 15 = 0$ and $x^2 + y^2 - 2x - 7 = 0$, then :

A. $P \in [-1, 0) \cup [0, 1) \cup [1, 2)$

B. $P \in [-1, 2) - \{0, 1\}$

C. $P \in (-1, 2)$

D. None of these

Answer: D

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2. If two circles $S_1 = x^2 + y^2 + 2gx + 2fy + c = 0$ and $S_2 = x^2 + y^2 + 2g'x + 2f'y + c' = 0$ to be cut orthogonally then show that :$2gg' + 2ff' = c + c'$

A. $2g_1g_2 + 2f_1f_2 = c_1 + c_2$

B. $2g_1g_2 - 2f_1f_2 = c_1 + c_2$

C. $2g_1g_2 + 2f_1f_2 = c_1 - c_2$

D. $2g_1g_2 - 2f_1f_2 = c_1 - c_2$

Answer: A

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3. The chord of contact of tangents from a point P to a circle passes through Q. If $l_1 and l_2$ are the length of the tangents from $P and Q$ to the circle, then PQ is equal to $\frac{l_1 + l_2}{2}$ (b) $\frac{l_1 - l_2}{2}$ $\sqrt{l12 + l22}$ (d) $2\sqrt{l12 + l22}$

A. $\frac{l_1 + l_2}{2}$

B. $\frac{l_1 - l_2}{2}$

C. $\sqrt{l_1^2 + l_1^2}$

D. $\sqrt{l_1 l_2}$

Answer: C

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4. If the circles $x^2 + y^2 + 2gx + 2fy + c = 0$ bisects $x^2 + y^2 + 2g'x + 2f'y + c' = 0$ then the length of the common chord of these two circles is -

A. 2g'(g-g')+2f'(f-f')=c-c'

B. 2g(g-g')+2f(f-f')=c-c'

C. g'(g-g')+f'(f-f')=c-c'

D. None of these

Answer: A

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5. Let number of points of intersection and number of common tangents of two circles $x^2 + y^2 - 6x - 2y + 1 = 0$ and $x^2 + y^2 + 2x - 6y + 9 = 0$ be m and n respectively. Which of the following is/are

A. 1

B. 2

C. 3

D. 4

Answer: D

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6. If the equation $x\cos\theta + y\sin\theta = p$represents the equation of common chord APQB of the circles $x^2 + y^2 = a^2$ and $x^2 + y^2 = b^2(a > b)$then AP is equal to :

A. $\sqrt{a^2 + p^2} + \sqrt{b^2 + p^2}$

B. $\sqrt{a^2 - p^2} + \sqrt{b^2 - p^2}$

C. $\sqrt{a^2 - p^2} - \sqrt{b^2 - p^2}$

D. $\sqrt{a^2 + p^2} - \sqrt{b^2 + p^2}$

Answer: C

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7. Consider a family of circles which are passing through the point $(-1, 1)$ and are tangent to x-axis. If (h, k) are the co-ordinates of the centre of the circles, then the set of values of k is given by the interval (1) $0 < k <$ (2) $k \geq$ (3) $\prec = k \leq$ (4) $k \leq$

A. $-\frac{1}{2} \leq k \leq \frac{1}{2}$

B. $k \leq \frac{1}{2}$

C. $0 \leq k \leq \frac{1}{2}$

D. $k \geq \frac{1}{2}$

Answer: D

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Exercise 1 Concept Builder Topicwise 3

1. If the ends of a focal chord of the parabola $y^2 = 8x$ are (x_1, y_1) and (x_2, y_2), then $x_1x_2 + y_1y_2$ is equal to

A. 12

B. 20

C. 0

D. -12

Answer: D

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2. The point $(2a, a)$ lies inside the region bounded by the parabola $x^2 = 4y$ and its latus rectum. Then,

A. $0 \leq a \leq 1$

B. $0 < a < 1$

C. $a > 1$

D. $a < 1$

Answer: B

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3. Find the equation of the lines joining the vertex of the parabola $y^2 = 6x$ to the point on it which have abscissa 24.

A. $y \pm 2x = 0$

B. $2y \pm x = 0$

C. $x \pm 2y = 0$

D. $2x \pm y = 0$

Answer: B

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4. The one end of the latus rectum of the parabola $y^2 - 4x - 2y - 3 = 0$ is at

A. (0, -1)

B. (0, 1)

C. (0, -3)

D. (3,0)

Answer: A

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5. If the focal distance of a point on the parabola $y^2 = 8x$ is 4, then its ordinate can be

A. ± 1

B. ± 2

C. ± 3

D. ± 4

Answer: D

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6. The equation of parabola whose vertex and focus lie on the axis of x at distances a and a_1 from the origin respectively, is

A. $y^2 = 4(a_1 - a)(x - a)$

B. $y^2 = 4(a_1 - a)(x - a_1)$

C. $y^2 = 4(a - a_1)(x - a_1)$

D. $y^2 = 4(a - a_1)(x - a)$

Answer: A

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7. The locus of the vertices of the family of parabolas $y = \frac{a^3x^2}{3} + \frac{a^2x}{2} - 2a$ is:

A. $xy = \frac{105}{64}$

B. $xy = \frac{3}{4}$

C. $xy = \frac{35}{16}$

D. $xy = \frac{64}{105}$

Answer: A

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8. Find the point on the parabolas $x^2 = 2y$ which is closest to the point $(0,\ 5)$.

A. $(\pm 2\sqrt{2}, 4)$

B. $(\pm 2, 2)$

C. $(\pm 3, 9/2)$

D. $\left(\pm \sqrt{2}, 1 \right)$

Answer: A

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9. A point p is such that the sum of squares of its distance from the axes of coordinates is equal to the square of its distance from the line $x - y = 1$. Find the locus of P

A. a straight line at right angle to the given line

B. a circle concentric with the given circle

C. a parabola with its axis parallel to the given line

D. a parabola with its axis perpendicular to the given line

Answer: D

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10. Find the value of P such that the vertex of $y = x^2 + 2px + 13$ is 4 units above the x-axis.

A. 2

B. ± 4

C. 5

D. ± 3

Answer: D

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Exercise 1 Concept Builder Topicwise 4

1. find the common tangents of the circle $x^2 + y^2 = 2a^2$ and the parabola$y^2 = 8ax$

A. $x = \pm (y + 2a)$

B. $y = \pm (x + 2a)$

C. $x = \pm (y + a)$

D. $y = \pm (x + a)$

Answer: B

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2. The normal at the point $\left(bt_1^2, 2bt_1\right)$ on the parabola $y^2 = 4bx$ meets the parabola again in the point $\left(bt_2^2, 2bt_2, \right)$ then

A. $t_2 = t_1 + \frac{2}{t_1}$

B. $t_2 = -t_1 - \frac{2}{t_1}$

C. $t_2 = -t_1 + \frac{2}{t_1}$

D. $t_2 = t_1 - \frac{2}{t_1}$

Answer: B

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3. The length of the chord of the parabola $x^2 = 4y$ passing through the vertex and having slope cot α is

A. $4 \cos \alpha \cos ec^2 \alpha$

B. $4 \tan \alpha \sec \alpha$

C. $4 \sin \alpha \sec^2 \alpha$

D. None of these

Answer: A

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4. Prove that the equation of the parabola whose focus is (0, 0) and tangent at the vertex is $x - y + 1 = 0$is $x^2 + y^2 + 2xy - 4x + 4y - 4 = 0.$

A. $x^2 + y^2 + 2xy - 4x + 4y - 4 = 0$

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

C. $y^2 - 4x + 4y - 4 = 0$

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

Answer: A

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5. If a chord which is normal to the parabola at one end subtend a right angle at the vertex, then angle to the axis is

A. 1

B. -2

C. $\sqrt{2}$

D. $\frac{1}{\sqrt{2}}$

Answer: C

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6. PN is any ordinate of the parabola $y^2 = 4ax$, the point M divides PN in the ratio m: n . Find the locus of M .

A. $y^2 = \left(m^{-\frac{1}{2}} - m^{-\frac{1}{2}}\right)^2 ax$

B. $y^2 = \left(m^{-\frac{1}{2}} + m^{-\frac{1}{2}}\right)^2 ax$

C. $y^2 = \left(m^{-\frac{1}{2}} - m^{-\frac{1}{2}}\right)^2 a$

D. None of these

Answer: B

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7. the tangent drawn at any point P to the parabola $y^2 = 4ax$ meets the directrix at the point K. Then the angle which KP subtends at the focus is

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

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

C. $\frac{\pi}{2}$

D. $\frac{2\pi}{2}$

Answer: C

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8. Two parabolas $y^2 = 4a(x - \lambda_1)$ and $x^2 = 4a(y - \lambda_2)$ always touch each other (λ_1, λ_2 being variable parameters). Then their point of contact lies on a

A. $xy = a^2$

B. $xy = 2a^2$

C. $xy = 4a^2$

D. None of these

Answer: C

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9. Three normals to the parabola $y^2 = x$ are drawn through a point (C, O) then C=

A. $C = \frac{1}{4}$

B. $C = \frac{1}{2}$

C. $C \geq \frac{1}{2}$

D. None of these

Answer: C

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Exercise 1 Concept Builder Topicwise 5

1. The ellipse $x^2 + 4y^2 = 4$ is inscribed in a rectangle aligned with the coordinate axes, which in turn is inscribed in another ellipse that passes through the point (4, 0). Then the equation of the ellipse is (1)

$x^2 + 16y^2 = 16$ (2) $x^2 + 12y^2 = 16$ (3) $4x^2 + 48y^2 = 48$ (4) $4x^2 + 64y^2 = 48$

A. $x + 12y^2 = 16$

B. $4x^2 + 48y^2 = 48$

C. $4x^2 + 64y^2 = 49$

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

Answer: A

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2. An ellipse has OB as the semi-minor axis, $FandF'$ as its foci, and $\angle FBF'$ a right angle. Then, find the eccentricity of the ellipse.

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

B. $\frac{1}{2}$

C. $\frac{1}{4}$

D. $\frac{1}{\sqrt{3}}$

Answer: A

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

A. a circle

B. a parabola

C. an ellipse

D. a hyperbola

Answer: C

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4. If a point P(x, y) moves along the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ and if C is the centre of the ellipse, then, 4 max {CP) + 5 min {CP}=

A. 25

B. 40

C. 45

D. 54

Answer: B

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5. If the focal distance of an end of the minor axis of an ellipse (referred to its axes as the axes of $xandy$, respectively) is k and the distance between its foci is $2h,$ them find its equation.

A. $\frac{x^2}{k^2}+\frac{y^2}{k^2+h^2}=1$

B. $\frac{x^2}{k^2}+\frac{y^2}{h^2-k^2}=1$

C. $\frac{x^2}{k^2} + \frac{y^2}{k^2 - h^2} = 1$

D. $\frac{x^2}{k^2} + \frac{y^2}{h^2} = 1$

Answer: C

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6. A man running a racecourse notes that the sum of the distances from the two flag posts from him is always 10 m and the distance between the flag posts is 8 m. Find the equation of the posts traced by the man.

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

B. $x^2 + y^2 = 25$

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

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

Answer: A

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7. The parametric form of the ellipse $4(x+1)^2+(y-1)^2=4$ is

A. $x=\cos\theta-1, y=2\sin\theta-1$

B. $x=2\cos\theta-1, y=2\sin\theta+1$

C. $x=\cos\theta-1, y=2\sin\theta+1$

D. $x=\cos\theta+1, y=2\sin\theta+1$

Answer: C

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8. Eccentricity of ellipse whose equation is

x=3 (cos t + sin t), y = 4 (cos t - sin t) where t is parameter is

A. $1/2$

B. $1/\sqrt{3}$

C. $\sqrt{7}/4$

D. $2/\sqrt{3}$

Answer: C

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9. If $P=(x, y), F_1=(3, 0), F_2=(-3, 0)$, and $16x^2+25y^2=400$, then PF_1+PF_2 equal 8 (b) 6 (c) 10 (d) 12

A. 8

B. 6

C. 10

D. 12

Answer: C

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Exercise 1 Concept Builder Topicwise 6

1. If the chords of contact of tangents from two poinst (x_1, y_1) and (x_2, y_2) to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ are at right angles, then find the value of $\frac{x_1 x_2}{y_1 y_2}$.

A. $\frac{a^4}{b^4}$

B. $\frac{b^4}{a^4}$

C. $-\frac{a^4}{b^4}$

D. $-\frac{b^4}{a^4}$

Answer: C

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2. If p is the length of the perpendicular from the focus S of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ to a tangent at a point P on the ellipse, then $\frac{2a}{SP} - 1 =$

A. $\frac{a^2}{p^2}$

B. $\frac{b^2}{p^2}$

C. p^2

D. $\frac{a^2+b^2}{p^2}$

Answer: B

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3. Let d be the perpendicular distance from the centre of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ to the tangent drawn at a point P on the ellipse. If $F_1 \& F_2$ are the two foci of the ellipse, then show the $(PF_1-PF_2)^2=4a^2\left[1-\frac{b^2}{d^2}\right]$.

A. $4a^2\left(1-\frac{b^2}{d^2}\right)$

B. $a^2\left(1-\frac{b^2}{d^2}\right)$

C. $4b^2\left(1-\frac{a^2}{d^2}\right)$

D. $b^2\left(1-\frac{a^2}{d^2}\right)$

Answer: A

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4. The sum of the squares of the perpendiculars on any tangents to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ from two points on the minor axis each at a distance ae from the center is $2a^2$ (b) $2b^2$ (c) $a^2+b^2\ a^2-b^2$

A. $2a^2$

B. $2b^2$

C. a^2+b^2

D. a^2-b^2

Answer: A

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5. If the chords of contact of tangents from two points (α, β) and (γ, δ) to the ellipse $\frac{x^2}{5}+\frac{y^2}{2}=1$ are perpendicular, then $\frac{\alpha\gamma}{\beta\delta}$ =

A. $\frac{4}{25}$

B. $-\frac{4}{25}$

C. $\frac{25}{4}$

D. $-\frac{25}{4}$

Answer: D

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6. Which one of the following points lies outside the ellipse $\left(x^2/a^2\right)+\left(y^2/b^2\right)$?

A. (a, 0)

B. (b, 0)

C. (-a, 0)

D. (a, b)

Answer: D

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Exercise 1 Concept Builder Topicwise 7

1. It the eccentricity of the hyerbola

$x^2 - y^2 \cos ce^2\alpha = 25$ is $\sqrt{5}$ time the eccentricity of the ellipse $x^2 \cos ce^2\alpha + y^2 = 5$, then α is equal to :

A. $\tan^{-1}\sqrt{2}$

B. $\sin^{-1}\sqrt{\frac{3}{4}}$

C. $\tan^{-1}\sqrt{\frac{2}{5}}$

D. $\sin^{-1}\sqrt{\frac{2}{5}}$

Answer: A

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2. The vertices of the hyperbola $9x^2 - 16y^2 - 36x + 96y - 252 = 0$ are

A. (6,3), (-2,3)

B. (6,3),(-6,3)

C. (-6,3),(-6,-3)

D. (2,3),(-2,3)

Answer: A

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3. If the foci of the ellipse $\frac{x^2}{16}+\frac{y^2}{b^2}=1$ and the hyperbola $\frac{x^2}{144}-\frac{y^2}{81}=\frac{1}{25}$ coincide write the value of b^2.

A. 9

B. 1

C. 5

D. 7

Answer: D

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4. The eccentricity of the hyperbola canjugate to $(x-1)^2 - 3(y-1)^2 = 1$ is

A. 3

B. 2

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

D. $\frac{3}{2}$

Answer: B

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5. If the eccentricity of the hyperbola $x^2 - y^2 \sec^2\theta = 4$ is $\sqrt{3}$ time the eccentricity of the ellipse $x^2 \sec^2\theta + y^2 = 16$, then the volue of θ equal

A. $\frac{\pi}{6}$

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

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

D. $\frac{\pi}{2}$

Answer: B

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6. A hyperbola, having the transverse axis of length $2\sin\theta$, is confocal with the ellipse $3x^2 + 4y^2 = 12$. Then its equation is

A. $x^2 + \sec^2\theta - y^2\sec^2 t\hat{e} = 1$

B. $x^2\sec^2\theta - y^2\cos ec^2\theta = 1$

C. $x^2\sin^2\theta - y^2\cos^2\theta = 1$

D. $x^2\cos^2\theta - y^2\sin^2\theta = 1$

Answer: A

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7. If e_1 is the eccentricity of the ellipse $\frac{x^2}{16}+\frac{y^2}{25}=1$ and e_2 is the eccentricity of the hyperbola passing through the foci of the ellipse and $e_1e_2=1$, then equation of the hyperbola is

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

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

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

D. $\frac{x^2}{9}-\frac{y^2}{36}=1$

Answer: B

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8. Which of the following is INCORRECT for the hyperbola $x^2-2y^2-2x+8y-1=0$

A. Its eccentricity is $\sqrt{2}$

B. Length of the transverse axis is $2\sqrt{3}$

C. Length of the conjugate axis is $2\sqrt{6}$

D. Latus rectum is $4\sqrt{3}$

Answer: A

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9. Find the equation of the hyperbola whose diretrix is $2x + y = 1$, focus (1, 2) and eccentricity $\sqrt{3}$.

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

B. $5x^2 - 2y^2 + 10xy + 2x + 5y - 20 = 0$

C. $4x^2 + 8y^2 + 8xy + 2x - 2y + 10 = 0$

D. None of these

Answer: A

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Exercise 1 Concept Builder Topicwise 8

1. Let $P(a\sec\theta, b\tan\theta)$ and $Q(a\sec c\phi, b\tan\phi)$ (where $\theta+\phi=\frac{\pi}{2}$ be two points on the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ If (h,k) is the point of intersection of the normals at P and Q then k is equal to (A) $\frac{a^2+b^2}{a}$ (B) $-\left(\frac{a^2+b^2}{a}\right)$ (C) $\frac{a^2+b^2}{b}$ (D) $-\left(\frac{a^2+b^2}{b}\right)$

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

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

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

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

Answer: D

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2. Tangents at any point on the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ cut the axes at A and B respectively, If the rectangle at OAPB (where O is origin) is completed then locus of point P is given by

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

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

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

D. None of these

Answer: A

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3. The two conics $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ and $y^2 = -\frac{b}{a}x$ intersect if and only if

A. $0 < a \leq \frac{1}{2}$

B. $0 < b \leq \frac{1}{2}$

C. $b^2 > a^2$

D. $b^2 < a^2$

Answer: B

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4. If $x = 9$ is the chord of contact of the hyperbola $x^2 - y^2 = 9$ then the equation of the corresponding pair of tangents is (A) $9x^2 - 8y^2 + 18x - 9 = 0$ (B) $9x^2 - 8y^2 - 18x + 9 = 0$ (C) $9x^2 - 8y^2 - 18x - 9 = 0$ (D) 9x^2-8y^2+18x+9=0`

A. $9x^2 - 8y^2 + 18x - 9 = 0$

B. $9x^2 - 8y^2 - 18x + 9 = 0$

C. $9x^2 - 8y^2 - 18x - 9 = 0$

D. $9x^2 - 8y^2 + 18x + 9 = 0$

Answer: C

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5. The value of m, for wnich the line $y = mx + 25\frac{\sqrt{3}}{3}$ is a normal to the conic $\frac{x^2}{16} - \frac{y^2}{9} = 1$, IS

A. $-\frac{2}{\sqrt{3}}$

B. $\sqrt{3}$

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

D. None of these

Answer: A

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6. If the circle $x^2 + y^2 = a^2$ intersects the hyperbola $xy = c^2$ at four points $P(x_1, y_1), Q(x_2, y_2), R(x_3, y_3),$ and $S(x_4, y_4),$ then $x_1 + x_2 + x_3 + x_4 = 0$ $y_1 + y_2 + y_3 + y_4 = 0$ $x_1x_2x_3x_4 = C^4$ $y_1y_2y_3y_4 = C^4$

A. $x_1 + x_2 + x_3 + x_4 = 0$

B. $y_1 + y_2 + y_3 y_4 = 2$

C. $x_1 x_2 x_3 x_4 = 2c^4$

D. $y_1 y_2 y_3 y_4 = 2c^4$

Answer: A

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Exercise 2 Concept Applicator

1. A circle C_1, of radius 2 touches both x-axis and y- axis. Another circle C_1 whose radius is greater than 2 touches circle and both the axes. Then the radius of circle is

A. $6 - 4\sqrt{2}$

B. $6 + 4\sqrt{2}$

C. $6 - 4\sqrt{3}$

D. $6 + 4\sqrt{3}$

Answer: B

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2. The equation of tangents drawn from the origin to the circle $x^2 + y^2 - 2rx - 2hy + h^2 = 0$ are:

A. $x = 0, y = 0$

B. $x = 1, y = 0$

C. $\left(h^2 - r^2\right)x - 2rhy = 0, y = 0$

D. $\left(h^2 - r^2\right)x - 2rhy = 0, x = 0$

Answer: D

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3. Let AB be a chord of the circle $x^2 + y^2 = r^2$ subtending a right angle at the centre.Then,the locus of the centroid of the ΔPAB as P moves on

the circle, is :

A. a parabola

B. a circle

C. an ellipse

D. a pair of straight lines

Answer: B

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4. The line joining $(5, 0)$ to $(10\cos\theta, 10\sin\theta)$ is divided internally in the ratio $2:3$ at P then the locus of P is

A. a pair of straight lines

B. a circle

C. a straight line

D. None of these

Answer: B

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5. Four distinct points (2k,3k) , (1,0), (0,1) and (0,0) lies on a circle for-

A. only one value of k

B. $0 < K < 1$

C. $k < 0$

D. all integral values of k

Answer: A

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6. The number of integral values of λ for which the equation $x^2 + y^2 + \lambda x + (1 - \lambda)y + 5 = 0$ is the equation fo a circle whose radius cannot exceed $5,$ is 14 (b) 18 (c) 16 (d) none of these

A. 14

B. 18

C. 16

D. None of these

Answer: C

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7. The cable of a uniformly loaded suspension bridge hangs in the form of a parabola. The roadway which is horizontal and 100 m long is supported by vertical wires attached to the cable, the longest wire being 30 m and the shortest being 6 m. Find t

A. 10.02 m

B. 9.11 m

C. 10.76m

D. 12.06m

Answer: B

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8. If from any point P, tangents PT, PT' are drawn to two given circles with centres A and B respectively, and if PN is the perpendicular from P on their radical axis, then $PT^2 - PT'^2$ =

A. PN. AB

B. 2PN. AB

C. 4PN. AB

D. None of these

Answer: B

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9. $y = 2x$ is a chord of the circle $x^2 + y^2 - 10x = 0$, then the equation of a circle with this chord as diameter is

A. 4

B. 2

C. 6

D. 0

Answer: C

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10. If $a \neq 0$ and the line $2bx + 3cy + 4d = 0$ passes through the points of intersection of the parabola $y^2 = 4ax$ and $x^2 = 4ay$, then

A. $d^2 + (3b - 2c)^2 = 0$

B. $d^2 + (3b + 2c)^2 = 0$

C. $d^2 + (2b + 3c)^2 = 0$

D. $d^2 + (2b + 3c)^2 = 0$

Answer: D

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11. Q57) If the circle $x^2 + y^2 + 2ax + cy + a = 0$ and $x^2 + y^2 - 3ax + dy - 1 = 0$ intersect at two distinct points Pand Q, then the line 5x+by-a=0 will pass through P and Q for A. No values of a B. Exactly one value of a C. Exactly two values of a D. Infinitely many value of a

A. exactly one value of a

B. no value of a

C. infinitely many values of a

D. exactly two values of a

Answer: B

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12. A rod AB of length 15 cm rests in between two coordinate axes in such a way that the end point A lies on x-axis and end point B lies on y-axis. A point P(x, y) is taken on the rod in such a way that AP = 6 cm. Show that the locus of P is an ellip

A. circle

B. ellipse

C. parabola

D. hyperbola

Answer: B

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13. Find the area of the triangle formed by the lines joining the vertex of the parabola $x^2 = 12y$ to the ends of its latus rectum

A. 9 square units

B. 12 square units

C. 14 square units

D. 18 square units

Answer: D

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14. The eccentricities of the ellipse $\frac{x^2}{\alpha^2} + \frac{y^2}{\beta^2} = 1, \alpha > \beta$ and $\frac{x^2}{9} + \frac{y^2}{16} = 1$ are equal. Which one of the following is correct?

A. $4\alpha = 3\beta$

B. $\alpha\beta = 12$

C. $4\beta = 3\alpha$

D. $9\alpha = 16\beta$

Answer: C

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15. The middle point of chord $x + 3y = 2$ of the conic $x^2 + xy - y^2 = 1,$ is

A. (5, -1)

B. (1, 1)

C. (2, 0)

D. (-1, 1)

Answer: D

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16. If $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1(a > b)$ and $x^2 - y^2 = c^2$ cut at right angles, then:

A. $a^2 + b^2 = 2c^2$

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

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

D. $a^2 - b^2 = c^2$

Answer: C

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17. If the line $x + my + am^2 = 0$ touches the parabola $y^2 = 4ax$ then the ponit of contact is

A. $(-am^2, 2am)$

B. $(-am^2, -2am)$

C. $(am^2, -2am)$

D. $(am^2, 2am)$

Answer: C

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18. 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

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19. The equation of one of the common tangent to the parabola $y^2 = 8x$ and $x^2 + y^2 - 12x + 4 = 0$ is

A. y = - x + 2

B. y = x - 2

C. y = x + 2

D. None of these

Answer: C

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20. If two circles $(x-1)^2+(y-3)^2=r^2$ and $x^2+y^2-8x+2y+8=0$ intersect in two distinct points , then

A. $r>2$

B. $2<r<8$

C. $r<2$

D. r = 2

Answer: B

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21. The number of points of intersection of the two curves $y = 2\sin x$ and $y = 5x^2 + 2x + 3$ is

A. 0

B. 1

C. 2

D. intinite

Answer: A

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22. The equation of the ellipse with its centre at (1, 2), focus at (6, 2) and passing through the point (4 ,6) is $\frac{(x-1)^2}{a^2} + \frac{(y-2)^2}{b^2} = 1$, then

A. $a^2 = 1, b^2 = 25$

B. $a^2 = 25, b^2 = 20$

C. $a^2 = 20, b^2 = 25$

D. None of these

Answer: D

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23. A normal chord of the parabola $y^2 = 4ax$ subtends a right angle at the vertex if its slope is

A. 1

B. -2

C. $\sqrt{2}$

D. $\frac{1}{\sqrt{2}}$

Answer: C

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24. Area of the greatest rectangle that can be inscribed in the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ is

A. ab

B. 2ab

C. $ab/2$

D. $\sqrt{ab}$

Answer: B

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25. The line ax + by = 1 cute ellipse $cx^2+dy^2=1$ only once if

A. $ca^2+db^2=1$

B. $\frac{c}{a^2}+\frac{d}{b^2}=1$

C. $\frac{a^2}{c}+\frac{b^2}{d}=1$

D. $ac^2 + bd^2 = 1$

Answer: C

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26. The line passing through the extremity A of the major exis and extremity B of the minor axis of the ellipse $x^2 + 9y^2 = 9$ meets is auxiliary circle at the point M. Then the area of the triangle with vertices at A, M, and O (the origin) is 31/10 (b) 29/10 (c) 21/10 (d) 27/10

A. $\frac{31}{10}$

B. $\frac{29}{10}$

C. $\frac{21}{10}$

D. $\frac{27}{10}$

Answer: D

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27. The locus of he middle points of the chords of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ which are at a constant disance 'd' form the cantre is

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

B. $\left(\frac{x^2}{a^2}+\frac{y^2}{b^2}\right)^2=d^2\left(\frac{x^2}{a^4}+\frac{y^2}{b^4}\right)$

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

D. None of these

Answer: B

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28. Find the equation of the normal to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ at the positive end of the latus rectum.

A. $x+ey-ae^3=0$

B. $x-ey+ae^3=0$

C. $x - ey - ae^3 = 0$

D. $x + ey + ae^3 = 0$

Answer: C

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29. If the line $y = mx + \sqrt{a^2m^2 - b^2}$ touches the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ at the point $(a\sec\theta, b\tan\theta)$, then find θ.

A. $\sin^{-1} m$

B. $\sin^{-1}\left(\frac{a}{bm}\right)$

C. $\sin^{-1}\left(\frac{b}{am}\right)$

D. $\sin^{-1}\left(\frac{bm}{a}\right)$

Answer: C

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30. The length of the transverse axis of a hyperbola, 2 cos0. the foci of the hyperbola are the same as that of the ellips `9x^(2)+16y^(2)=144. the equation of the hypperbola is

A. $\frac{x^2}{\cos^2\alpha} - \frac{y^2}{7-\cos^2\alpha} = 1$

B. $\frac{x^2}{\cos^2\alpha} - \frac{y^2}{7+\cos^2\alpha} = 1$

C. $\frac{x^2}{1+\cos^2\alpha} - \frac{y^2}{7+\cos^2\alpha} = 1$

D. $\frac{x^2}{1+\cos^2\alpha} - \frac{y^2}{7-\cos^2\alpha} = 1$

Answer: A

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