MATHS

BOOKS - CENGAGE MATHS (HINGLISH)

ELLIPSE AND HYPERBOLA

Question Bank

1. Let P be ány point on ellipse $3x^2 + 4y^2 = 12$ and S, S^1 are its foci then the

locus of the centroid of triangle PSS^1 is a conic C whose length of latus rectum is

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2. A triangle is formed by the points $A(0, 0)$, $B(3, 0)$ and $C(3, 4)$. A and C are foci of ellipse and B lies on the ellipse. If arca of ellipse is $\frac{7\pi}{2}\sqrt{P}(P \in N)$, then the value of P is

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3. An ellipse with focii $(1, 4)$ and (α, β) touches x -axis at $(5, 0)$. Then value of $(\alpha - \beta)$ is

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4. The minimum value of the segment of a tangent to the ellipse $\frac{x^2}{12321} + \frac{y^2}{1234321} = 1$ intercepted by thè coordinate axes is

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5. The area of the triangle formed by a tangent to the ellipse $\frac{x^2}{25}+\frac{y^2}{9}=1$ and the co-ordinate axes is always greater than or equal to

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6. Let PQ is a tangent to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ meeting the positive $x\&y$ axis at points $P\&Q$ respectively. Point R divides

PQ internally in the ratio $2:1$. -If locus of R is $\frac{a^2}{x^2}+\frac{4b^2}{y^2}=\lambda$, then λ is equal to

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7. If a tangent of slope m at a point of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ passes through $(2a, 0)$ and if e denotes the eccentricity of ellipse, then $3m^2+e^2$ is

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8. If the eccentricity of the ellipse $\frac{x^2}{a^2} + 2 + \frac{y^2}{a^2} + 5 = 1$ be $\frac{1}{\sqrt{3}}$, then length of latus rectum of ellipse is

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9. Area of the ellipse $(2x + 3y - 5)^2 + 4(-3x + 2y + 1)^2 = 52$ is equal to

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10. Let P be a point in the first quadrant lying on the ellipse $\frac{x^2}{8}+\frac{y^2}{18}=1$. Let AB be the tangent at P to the ellipse meeting the x -axis at A and y axis at B. If O is the origin, then the minimum, possible area of ΔOAB is (in square units)

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11. If maximum distance of any point on the curve $5x^2+4y^2+xy-2=0$ from its centre be L and $L=\frac{a}{\sqrt{b}-\sqrt{2}}$, then (b-a) is

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12. A tangent.is drawn to the curve, $\frac{x^2}{16} + \frac{y^2}{9} = 1$ at the point P meeting the co-ordinate axis in T and t. If OY is the perpendicular from the origin on the tangent then find the value of the product $(Tt)(PY)$

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13. The maximum and minimum distance of point $(3, -1)$ from the ellipse $x^2 + 4y^2 - 4x + 8y - 8 = 0$ is M and m respectively, where $M^\beta + m^3$ is

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14. If the circle $x^2 + y^2 - 2x - 4y + k = 0$ and director circle of ellipse $\frac{x^2}{4} + y^2 = 1$ intersects orthogonally then k equals

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15. Least value of modulus of slope of a line for which the line may touch the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{l}\left(a^3 + a^2 + a\right)^2 = 1$ is $(a$ is non-zero real number $)$

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16. A normal to the hyperbola $x^2 - 4y^2 = 4$ has equal intercepts on positive x and y axes. If this normal touches the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, then $3\left(a^2 + b^2\right)$ -is equal to

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17. Let any double ordinate PNP of the hyperbola $\frac{x^2}{25} - \frac{y^2}{16} = 1$ be produced both sides to meet the asymptotes in Q and Q, then $PQ.\ P^1Q$ is equal to

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18. Let AB is the latus rectum of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ such that triangle

OAB is equilateral where $\hat{} 4O$ is origin and under this condition eccentricity of the hyperbola is given as $\frac{1+\sqrt{p}}{2\sqrt{q}}$ (where p, q are numbers) then $p-q$ is

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19. If e and e_1 are the eccentricities of the hyperbolas $xy=5$ and $x^2-y^2=18$, then $e^2+e_1^2$ is

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20. Let the focus of conic $\frac{(y+x)^2}{16} - \frac{(y-x)^2}{8} = 1$ is at (a, b) then $\frac{a^2+b^2}{4}$ is

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21. Let $H: y(3y+4x) = -4$ is a hyperbola and $y = mx + c$ is its conjugate axis. Length of latus rectum of H is L, eccentricity e.and (x_1, y_1) is one. vertex with $y_1 > 0$, then $4e^2$ is equal to

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22. A tangent to the circle $x^2 + y^2 = 4$ intersects the hyperbola $x^2 - 2y^2 = 2$ at P and Q. If locus of mid-point of PQ is. $\left(x^2 - 2y^2\right)^2 = \lambda\left(x^2 + 4y^2\right)$, then λ equals

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23. If equation of common tangent to parabola $y^2 - 8x = 0$ and hyperbola $y^2 - 3x^2 + 3 = 0$ is

$2x + \frac{cy}{\sqrt{2}} + 1 = 0 (c \in R)$ then absolute value of ' c '

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24. If the set of values of λ for which two distinct tangents are drawn from a point $(2, \lambda)$ to the curve $x = 4\sqrt{1 + \frac{y^2}{9}}$ is a_1, a_2 then $|a_1 - a_2|$ is equal to

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25. A normal to the hyperbola $\frac{x^2}{6} - \frac{y^2}{2}$ has equal intercepts on positive x and y -axis. If this normal touches the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, then find the value of $a^2 + \frac{b^2}{4}$.

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26. If $\frac{(3x - 4y - 1)^2}{100} - \frac{(4x + 3y - 1)^2}{225} = 1$, then length of latusrectum of hyperbola is

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27. The eccentricity of the conic section represented by $(x+y)^2 - 4 = x^2 + y^2$ is

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28. The maximum distance between the tangents drawn to the hyperbola $9x^2 - 16y^2 = 144$ at $P(\theta)$ and $Q(\pi - \theta)$ is

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