MATHS

BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

ELLIPSE

Question Bank

1. The foci of the ellipse $4x^2 + 3y^2 = 24$ are the points

A. $(\pm 2, 0)$

B. $(0, \ \pm 2\sqrt{2})$

C. $(0, \ \pm \sqrt{2})$

D. $(\pm 2\sqrt{2}, 0)$

Answer: C

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2. The coordinates of the foci of an ellipse $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ are given by $(a > b)$

A. (h, k)

B. $(h \pm ae, k)$

C. $(h, k \pm ae)$

D. None of these

Answer: B

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3. The distance between the foci of the ellipse $5x^2 + 9y^2 = 45$ is

A. 2

B. $2\sqrt{2}$

C. 4

D. $4\sqrt{2}$

Answer: C

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4. In the ellipse $9x^2 + 5y^2 = 45$, the distance between the foci is

A. $4\sqrt{5}$

B. $3\sqrt{5}$

C. 3

D. 4

Answer: D

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5. If the latus rectum of the ellipse $x^2 \tan^2 \alpha + y^2 \sec^2 \alpha = 1$ is $\frac{1}{2}$ then α=

A. $\frac{\pi}{12}$

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

C. $\frac{5\pi}{12}$

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

Answer: A

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6. The vertices of the ellipse

$4x^2 + y^2 - 16x - 6y - 39 = 0$

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

B. (10,3),(-6,3)

C. (2,11),(2,-5)

D. (-10,3),(-6,3)

Answer: C

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7. The centre of the ellipse $8x^2 + 6y^2 - 16x + 12y - 34 = 0$ is

A. $(1, 1)$

B. $(-1, 1)$

C. $(1, -1)$

D. $(-1, -1)$

Answer: C

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8. The length of the major axis of

$4x^2 + 9y^2 + 8x + 36y + 4 = 0$ is

A. 3

B. 4

C. 5

D. 6

Answer: D

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9. The length of the minor axis of $3x^2 + 4y^2 + 6x - 8y - 5 = 0$

A. $4\sqrt{3}$

B. $2\sqrt{3}$

C. 2

D. 4

Answer: B

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10. The eccentricity of the ellipse $8x^2 + 6y^2 - 16x + 12y - 34 = 0$ is

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

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

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

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

Answer: C

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11. The eccentricity of the ellipse

$4x^2 + 9y^2 - 24x + 36y + 36 = 0$ is

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

B. $\frac{\sqrt{5}}{3}$

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

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

Answer: B

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12. The equations of the directrices of the ellipse $3x^2 + 4y^2 + 6x - 8y - 5 = 0$ are

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

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

C. $x = 3, x + 5 = 0$

D. $x + 3 = 0, x = 5$

Answer: C

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13. Centre of the ellipse

$3x^2 + 4y^2 + 6x + 16y - 29 = 0$ is at

A. $(1, 1)$

B. $(1, -2)$

C. $(-1, -2)$

D. $(1, 2)$

Answer: D

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14. (2,4) and (10,10) are the ends of a latus rectum of an ellipse with $e = \frac{1}{2}$. The length of the major axis is

A. $\frac{20}{3}$

B. $\frac{40}{3}$

C. $\frac{25}{3}$

D. $\frac{50}{3}$

Answer: B

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15. In an ellipse, minor axis =8 and e= (sqrt(5))/(3). Then the major axis is

A. 6

B. 12

C. 10

D. 16

Answer: B

16. If the major axis of an ellipse is 3 times its minor axis its ecentricity is

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

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

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

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

Answer: A

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17. The equation of the ellipse whose vertices are (-4,1) and (6,1) and a focus lies on $x - 2y - 2$=0 is

A. $\frac{(x-1)^2}{25}+\frac{(y-1)^2}{16}=1$

B. $\frac{(x+1)^2}{25}+\frac{(y+1)^2}{16}=1$

C. $\frac{(x-1)^2}{16}+\frac{(y-1)^2}{25}=1$

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

Answer: A

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18. If $y=mx+c$is a tangent to$\frac{x^2}{a^2}+\frac{y^2}{b^2}$=1 then b^2=

A. $(am + c)^2$

B. $a^2m^2 + c^2$

C. $\frac{a}{m}$

D. $c^2 - a^2m^2$

Answer: D

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19. The line $2x + 3y = 12$ touches the ellipse $4x^2 + 9y^2 = 72$ at

A. $(0, 4)$

B. $(3, 2)$

C. $(6, 0)$

D. $(-3, -2)$

Answer: B

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20. The condition that $y = mx + c$ is a tangent to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2}$=1 is

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

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

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

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

Answer: D

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21. If $\frac{x}{a} + \frac{y}{b} = \sqrt{2}$ touches the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ then its eccentric angle θ is equal to

A. 0°

B. 90°

C. 45°

D. 60°

Answer: C

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22. The number of values of c such that the line $y = 4x + c$touches the curve $\frac{x^2}{4} + y^2 = 1$ is

A. 0

B. 1

C. 2

D. indefinite

Answer: C

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23. The number of real tangents that can be drawn to the ellipse $3x^2 + 5y^2 = 32$ and $25x^2 + 9y^2 = 450$ passing through $(3, 5)$ is

A. 0

B. 2

C. 3

D. 4

Answer: C

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24. The equations of the tangents to the ellipse $x^2 + 4y^2 = 25$ at the point whose ordinate is2 is

A. $3x + 8y - 25 = 0$ and $3x - 8y + 25 = 0$

B. $8x + 3y - 25 = 0$ and $3x + 8y - 25 = 0$

C. $3x - 8y + 25 = 0$ and $3x + 8y + 25 = 0$

D. $8x - 3y + 25 = 0$ and $8x - 3y - 25 = 0$

Answer: A

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25. The equation of the normal to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$at the end of the latus rectum in the first quadrant is

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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26. The normal to the ellipse $x^2 + 4y^2 = 20$ at the point $(4, -1)$ is given by

A. $x + 2y = 6$

B. $x + 2y = 2$

C. $y = y + 5$

D. $x + y = 3$

Answer: D

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27. If the line $y\cos\alpha = x\sin\alpha + a\cos\alpha$ be a tangtnt to the circle $x^2 + y^2 = a^2$ then

A. $\left(\frac{a^2}{p}, \frac{b^2}{p}\right)$

B. $\left(\frac{a^2}{p\sin^2\alpha}, \frac{b^2}{p\cos^2\alpha}\right)$

C. $\left(\frac{a^2\sin^2\alpha}{p}, \frac{b^2\cos^2\alpha}{p}\right)$

D. $\left(\frac{a^2\cos\alpha}{p}, \frac{b^2\sin\alpha}{p}\right)$

Answer: D

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28. The equation of the normal to the ellipse $\frac{x^2}{10} + \frac{y^2}{5} = 1$ at $(\sqrt{8}, 1)$ is

A. $10x + 5y = 1$

B. $y = 2(x + 1)$

C. $x = \sqrt{2}(y + 1)$

D. $y = \sqrt{8}(x + 1)$

Answer: C

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29. Equation of the normal to the ellipse $x^2 + 2y^2 = 4$at the point $\left(\frac{\pi}{4}\right)$ is

A. $x - \sqrt{2}y = 1$

B. $\sqrt{2}x + y = 1$

C. $x + y\sqrt{2} = 1$

D. $\sqrt{2}x - y = 1$

Answer: D

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30. The equation of the tangent to the parabola $y^2 = 16x$ at (1,4) is

A. $9x - 2y = 56$

B. $9x - 2y + 56 = 0$

C. $9x = 2y + 56$

D. none of these

Answer: D

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31. The tangent of the ellipse $x^2 + 5y^2 = 14$ at $(3, -1)$ is given by

A. $3x - 5y = 14$

B. $3x + 5y = 4$

C. $5y - 3x + 14 = 0$

D. none of these

Answer: A

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32. If any tangent to $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ makes intercepts p and q on the axes then $\frac{a^2}{p^2} + \frac{b^2}{q^2}$=

A. 4

B. 3

C. 2

D. 1

Answer: D

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33. The tangent making an angle 60° with the major axis and touching $\frac{x^2}{28} + \frac{y^2}{16} = 1$ is

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

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

C. $y = x\sqrt{3} \pm 10$

D. $y = x\sqrt{3} \pm 12$

Answer: C

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34. If the minor axis of an ellipse subtends an angle60° at each focus then the eccentricity of the ellipse is

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

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

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

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

Answer: B

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35. The auxilary circle of the ellipse $9x^2 + 4y^2 = 1$ is

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

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

C. $4\left(x^2 + y^2\right) = 1$

D. $9\left(x^2 + y^2\right) = 1$

Answer: D

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36. P is any point on the ellipse $9x^2 + 36y^2 = 324$ whose foci are S and S'. Sp + S'P =

A. 9

B. 12

C. 27

D. 36

Answer: B

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37. Let P be a variable point on the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ with foci S_1 and S_2. If A be the

area of the triangle PS_1S_2, then the maximum value of A is :

A. $2abe$

B. abe

C. none of these

D. none of these

Answer: A

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38. Eccentric angle of a point on the ellipse $x^2 + 3y^2 = 6$ at a distance 2units from the centre of the ellipse is

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

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

C. $\frac{\pi}{6}$ or $\frac{5\pi}{6}$

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

Answer: A

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39. The eccentricity of an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ whose latus rectum is half of its minor axis is

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

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

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

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

Answer: C

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40. The distance of the point θ' on the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ from a focus is

A. $a(e + \cos\theta)$

B. $a(1 + e\cos\theta)$

C. $a(1 - e\cos\theta)$

D. $a(1 + 2e\cos\theta)$

Answer: C

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41. The number of real tangents that can be drawn to the ellipse $3x^2 + 5y^2 = 32$ and $25x^2 + 9y^2 = 450$ passing through $(3, 5)$ is

A. 0

B. 2

C. 3

D. 4

Answer: C

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42. The number of tangents from $(4, 7)$ to the ellipse $\frac{x^2}{16} + \frac{y^2}{25} = 1$ is

A. 1

B. 2

C. 3

D. 0

Answer: B

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43. S_1 and S_2 are the foci of an ellipse and B is the end of the minor axis. If the triangle S_1S_2B is an equilateral triangle, then eccentricity of the ellipse is

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

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

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

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

Answer: D

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44. The length of the latus - rectum of the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$ is

A. ae

B. a^2e^2

C. ae^3

D. a^2e^3

Answer: C

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45. The length of the major axis is three times the length of minor axis, then the eccentricity of the ellipse is

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

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

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

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

Answer: D

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46. An ellipse has OB as a semi-minor axis. S_1, S_2 are its foci and the angle S_1BS_2 is a right-angle, then the eccentricity of the ellipse is :

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

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

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

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

Answer: C

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47. The equation of the locus of the middle point of the portion of the tangent to ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$ intercepted between the axes is

A. $9x^2 - 16y^2 = 4x^2y^2$

B. $9x^2 + 16y^2 = 4x^2y^2$

C. $16x^2 + 9y^2 = 4x^2y^2$

D. $16x^2 - 9y^2 = 4x^2y^2$

Answer: B

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48. If $\sqrt{3}bx + ay = 2ab$ is a tangent to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ then the eccentric angle of the point is

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

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

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

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

Answer: A

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49. If a normal at any point on the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1(a>b)$meet the major and minor axes at $M$and N respectively, such that $\frac{PM}{PN}=\frac{2}{3}$, then the eccentricity =

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

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

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

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

Answer: D

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50. Locus of the point of intersection of the tangent at the ends of focal chord of an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1,(b<a)$ is

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

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

C. $x=\pm\frac{ab}{\sqrt{a^2-b^2}}$

D. $y=\pm\frac{a^2}{\sqrt{a^2-b^2}}$

Answer: A

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51. The equation of a common tangent to the circle $x^2 + y^2 = 16$ and the ellipse $\frac{x^2}{49} + \frac{y^2}{4} = 1$ is

A. $y = \frac{2}{\sqrt{11}}x - 4\sqrt{\frac{15}{11}}$

B. $x = \frac{2}{\sqrt{11}}y + 4\sqrt{\frac{15}{11}}$

C. $y = \frac{2}{\sqrt{11}}x + 4\sqrt{\frac{15}{11}}$

D. $y = 4\sqrt{\frac{15}{11}}x + \frac{2}{\sqrt{11}}$

Answer: C

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52. . If PQ and PR are the tangents from P to the ellipse $\frac{x^2}{2} + y^2 = 1$, and the equation of QR is $x + 3y = 1$, then P=

A. $(3, 2)$

B. $(-2, 3)$

C. $(-3, 2)$

D. $(2, 3)$

Answer: D

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53. If the tangents drawn from a point $(1, 2\sqrt{3})$ to the ellipse $\frac{x^2}{9} + \frac{y^2}{b^2} = 1$ are at right angles then b=

A. 4

B. 1

C. 2

D. 3

Answer: C

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54. Circles are described on the major axis and on the line joining the foci of an ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$ as diameters. The radii of the circles are in the ratio

A. $5:3$

B. $3:5$

C. $3:1$

D. $1:3$

Answer: A

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55. Normal at one end of the latus rectum of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ passes through one end of minor axis, then $e^4+e^2=$ (where e is the eccentricity of the ellipse)

A. 2

B. 3

C. 1

D. 4

Answer: C

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56. Equation of the ellipse is $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ with foci S_1 and S_2 The maximum area of the triangle PS_1S_2, where P is any point on the ellipse is

A. $(1)2abe$

B. $2aeb$

C. aeb

D. $(1)3abe$

Answer: C

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57. If e_1 is the eccentricity of ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and e_2 is the eccentricity of $\frac{x^2}{b^2}+\frac{y^2}{a^2}=1$ then

A. $e_1 = e_2$

B. $e_1 e_2 = 1$

C. $\frac{1}{e_1^2} + \frac{1}{e_2^2} = 1$

D. $\frac{e_1}{e_2} = 2$

Answer: A

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58. If S_1 and S_2 are the foci of $\frac{x^2}{25} + \frac{y^2}{16} = 1$ and P is any point on it, then the maximum area of the triangle PS_1S_2 is

A. $12sq.\ units$

B. $15(sq).\ units$

C. $25(sq).\ units$

D. $16(sq).\ units$

Answer: A

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59. C is the centre of the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$ and S is one of the foci. The ratio of CS to semi major axis is

A. $5:3$

B. $2:3$

C. $3:5$

D. $4:5$

Answer: C

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60. If the eccentricity of the ellipse is $\frac{2}{3}$, then the ratio of the major axis to minor axis is

A. $\sqrt{5}:3$

B. $3:\sqrt{5}$

C. $5:9$

D. $9:5$

Answer: B

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61. The product of the perpendiculars from the foci of the ellipse $\frac{x^2}{16}+\frac{y^2}{4}=1$ onto any tangent to the ellipse is

A. 4

B. 16

C. 2

D. 14

Answer: A

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62. If P is any point on the ellipse $16x^2 + 25y^2 = 400$ then $PS_1 + PS_2 =$, where S_1 and S_2 are the foci of the ellipse.

A. 6

B. 8

C. 10

D. 12

Answer: C

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63. The equation $\frac{x^2}{10-a}+\frac{y^2}{4-a}=1$ represents an ellipse if

A. $a < 4$

B. $a > 4$

C. $4 < a < 10$

D. $agt0$

Answer: A

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64. The equation of the director circle of the ellipse $x^2 + 2y^2 + 2x - 12y + 15 = 0$ is :

A. $x^2 + y^2 - 2x + 6y + 4 = 0$

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

C. $x^2 + y^2 - 2x - 6y + 4 = 0$

D. $x^2 + y^2 + 2x + 6y + 4 = 0$

Answer: B

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65. Equation of the auxilary circle of the ellipse

$3x^2 + 4y^2 + 6x + 16y - 29 = 0$ is

A. $x^2 + y^2 + 2x + 4y - 11 = 0$

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

C. $x^2 + y^2 + 2x - 4y - 11 = 0$

D. $x^2 + y^2 - 2x - 4y - 11 = 0$

Answer: A

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66. Length of the latus rectum of the ellipse $2x^2 + y^2 - 8x + 2y + 7 = 0$ is

A. $\sqrt{2}$

B. 2

C. 8

D. 6

Answer: A

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67. The foci of the ellipse $25(x+1)^2 + 9(y+2)^2 = 225$ are at

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

B. $(-1, -2)$ and $(-2, -1)$

C. $(-1, -2)$ and $(-1, -6)$

D. $(-2, 1)$ and $(-2, 6)$

Answer: A

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68. The locus of the point which moves such that sum of its distance from $(2, -3)$ and $(2, 5)$ is always 10 is

A. $\frac{(x-2)^2}{16}+\frac{(y-1)^2}{25}=1$

B. $\frac{(x-2)^2}{9}+\frac{(y-1)^2}{25}=1$

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

D. $\frac{(x-2)^2}{25}+\frac{(y-1)^2}{16}=1$

Answer: B

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69. If S_1 and S_2 are the foci of $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and P is any point on it, then the area PS_1S_2

will be maximum, when P=

A. $(a, 0)$

B. $(0, b)$

C. (a, b)

D. (b, a)

Answer: B

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70. If the tangents drawn from a point $\left(1, 2\sqrt{3}\right)$ to the ellipse $\frac{x^2}{9} + \frac{y^2}{b^2} = 1$ are at right angles then b=

A. 1

B. 4

C. 2

D. 3

Answer: C

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71. If e_1 and e_2 are eccentricities of the ellipse $\frac{x^2}{18} + \frac{y^2}{4} = 1$ and the hyperbola $\frac{x^2}{9} - \frac{y^2}{4} = 1$ respectively, then the relation between e_1 and e_2 is

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

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

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

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

Answer: C

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72. The tangents at the ends of the latus rectum LS_1L' of the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$ meet at

A. $(9, 0)$

B. $\left(\frac{9}{\sqrt{5}}, 0\right)$

C. $\left(9, \frac{9}{\sqrt{5}}\right)$

D. $\left(\frac{9}{\sqrt{5}}, 4\right)$

Answer: B

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73. The tangent to the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$ at the end of the latus rectum, in the second quadrant, meets the coordinate axes at

A. $(-5, 0), (0, 4)$

B. $(-4, 0), (0, 5)$

C. $\left(-\frac{25}{3}, 0\right), (0, 5)$

D. $(-5, 0), \left(0, \frac{25}{3}\right)$

Answer: C

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74. Area of the quadrilateral formed by the tangents at the ends of latus rectum of $\frac{x^2}{25} + \frac{y^2}{16} = 1$ is (in sq. units)

A. $\frac{250}{3}$

B. 250

C. $\frac{125}{30}$

D. 125

Answer: A

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75. The eceentricity of the ellipse whose axes are the coordinate axes and which passes through the points (2,2) and (3,1) is

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

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

C. $\sqrt{\frac{2}{5}}$

D. $\frac{2}{5}$

Answer: C

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76. Area of the greatest rectangle that can be inseribed in the ellipse $\frac{x^2}{16} + \frac{y^2}{4} = 1$ is

A. 2

B. $\sqrt{8}$

C. 8

D. 16

Answer: D

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77. Find the equation of the ellipse whose centre is at the origin and major axis along x-axis and passing through the points $(-3, 1)$ and $(2, -2)$.

A. $5x^2 + 3y^2 = 32$

B. $3x^2 + 5y^2 = 32$

C. $5x^2 - 3y^2 = 32$

D. $3x^2 + 5y^2 + 32 = 0$

Answer: B

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78. The equation of the ellipse whose focus is $(1, -1)$ the directrix the line $x - y - 3 = 0$ and eccentricity $\frac{1}{2}$ is

A. $7x^2 + 2xy + 7y^2 - 10x + 10y + 7 = 0$

B. $7x^2 + 2xy + 7y^2 + 7 = 0$

C. $7x^2 + 2xy + 7y^2 + 10x - 10y - 7 = 0$

D. none

Answer: A

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79. The length of the latus rectum of the ellipse $3x^2 + 4y^2 = 12$ is

A. 4

B. 3

C. 8

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

Answer: D

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80. If e is the eccentricity of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1, (a < b)$ then

A. $b^2 = a^2(1 - e^2)$

B. $a^2 = b^2(1 - e^2)$

C. $a^2 = b^2(e^2 - 1)$

D. $b^2 = a^2(e^2 - 1)$

Answer: B

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81. The eccentricity of the ellipse $9x^2 + 25y^2 = 225$ is

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

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

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

D. $\frac{9}{25}$

Answer: C

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82. The length of the latus rectum of the ellipse

$49x^2 + 64y^2 = 3136$

A. $\frac{49}{64}$

B. $\frac{64}{3136}$

C. $\frac{49}{4}$

D. none of these

Answer: C

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83. The P is any point on the ellipse $4x^2 + 16y^2 = 64$ whose foci are S and S', then $SP + S'P =$

A. 4

B. 8

C. 12

D. 16

Answer: B

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84. The product of the perpendiculars from the foci on any tangent to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is

A. a^2

B. $a^2 - b^2$

C. b^2

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

Answer: C

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85. Length of the latus rectum of the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$ is

A. $\frac{9}{5}$

B. $\frac{18}{5}$

C. $\frac{50}{3}$

D. $\frac{25}{3}$

Answer: B

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86. The equation of the ellipse whose one focus is at $(4, 0)$ and whose eccentricity is $\frac{4}{5}$ is

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

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

C. $\frac{x^2}{5^2} + \frac{y^2}{4^2} = 1$

D. $\frac{x^2}{4^2} + \frac{y^2}{5^2} = 1$

Answer: B

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87. The centre of the ellipse

$9x^2 + 5y^2 - 36x - 50y + 116 = 0$ is

A. $(2, 5)$

B. (0,5)`

C. $(1, 2)$

D. $(-2, 1)$

Answer: A

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88. If $y = x + c$ is a tangent to the ellipse $9x^2 + 16y^2 = 144$, then c=

A. 5

B. 4

C. 6

D. 2

Answer: A

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89. If the latus-rectum of the ellipse is half the minor axis, then its eccentricity is :

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

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

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

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

Answer: C

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90. Eccentricity of the ellipse

$$25x^2 + 9y^2 - 150x - 90y + 225 = 0$$

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

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

C. 1

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

Answer: A

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91. An ellipse with eccentricity $e = \frac{1}{2}$ has a focus at $(0, 0)$ and the corresponding directrix $x + 6 = 0$. The equation of the ellipse is

A. $3x^2 + 5y^2 + 12x - 36 = 0$

B. $3x^2 + 4y^2 - 12x + 36 = 0$

C. $3x^2 + 4y^2 - 12x - 36 = 0$

D. none of these

Answer: C

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92. An ellipse has a minor axis of length 6 and the distance between its foci is 8 . Its equation is

A. $\frac{x^2}{6} + \frac{y^2}{5} = 1$

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

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

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

Answer: D

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93. In an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ if the distance between the directrix is 3 times the distance between the foci, then the eccentricity is

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

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

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

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

Answer: B

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94. The angle between the lines joining the foci of an ellipse to an extremity of the minor axis is 90°, then the eccentricity of the ellipse is

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

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

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

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

Answer: B

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95. The ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1 cuts the x-a \xi sat$ A and A (prime) and y- axis at B and B^(prime) . $Thel \in ejo \in \in gthefocusS$ and $Bmakesan\angle$ (3 pi)/(4) $withthe$ x-axis`. The eccentricity of the ellipse is

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

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

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

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

Answer: B

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96. The locus of the point of intersection of two perpendicular tangents to $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, lies on

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

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

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

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

Answer: C

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97. An ellipse has its centre $(1, -1)$ and semi major axis is 8, which passes through the point $(1, 3)$. Then the equation of the ellipse is

A. $\frac{(x-1)^2}{64}+\frac{(y-1)^2}{16}=1$

B. $\frac{(x+1)^2}{64}+\frac{(y+1)^2}{16}=1$

C. $\frac{(x-1)^2}{64}+\frac{(y+1)^2}{16}=1$

D. $\frac{(x-1)^2}{16}+\frac{(y+1)^2}{64}=1$

Answer: C

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98. The distance between the foci is 6, $e=\frac{1}{2}$, the length of the major axis of the ellipse is

A. 12

B. 6

C. 64

D. 8

Answer: A

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99. Equation of the tangent and the normal drawn at the point $(6, 0)$ on the ellipse $\frac{x^2}{36} + \frac{y^2}{9} = 1$ respectively are

A. $y + x - 6 = 0, y - x + 6 = 0$

B. $x = 6, y = 0$

C. $x = -6, y = 0$

D. $x = 0, y = 3$

Answer: B

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100. The locus of the point of intersection of the perpendicular tangents to the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$ is

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

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

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

D. $x^2 + y^2 = 13$

Answer: D

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101. The radius of the circle passing through the foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$, and having its centre (0, 3) is :

A. 4

B. 3

C. $\sqrt{12}$

D. $\frac{7}{2}$

Answer: A

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102. The equation to the ellipse whose foci are $(\pm 2, 0)$ and eccentricity $\frac{1}{2}$ is :

A. $\frac{x^2}{12}+\frac{y^2}{16}=1$

B. $\frac{x^2}{16}+\frac{y^2}{12}=1$

C. $\frac{x^2}{16}+\frac{y^2}{8}=1$

D. none of these

Answer: B

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103. 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 then the value of b^2 is

A. 1

B. 5

C. 7

D. 9

Answer: C

104. The eccentricity of an ellipse, with its centre at origin is $\frac{1}{2}$ then the equation of the ellipse is, if one of the directrices is x=4

A. $3x^2 + 4y^2 = 1$

B. $3x^2 + 4y^2 = 12$

C. $4x^2 + 3y^2 = 12$

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

Answer: B

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105. 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. $\frac{a}{b}$

B. $\sqrt{ab}$

C. ab

D. 2ab

Answer: D

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106. An ellipse has O B as semi minor axis, F and F' its foci and the angle FBF' is a right angle. Then the eccentricity of the ellipse is

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

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

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

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

Answer: D

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107. A circle touches the x - axis and also touches the circle with centre (0,3) and radius 2. The locus of the centre of the circle is :

A. a hyperbola

B. a parabola

C. an ellipse

D. a circle

Answer: B

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108. A circle touches the x - axis and also touches the circle with centre (0,3) and radius 2. The locus of the centre of the circle is :

A. a hyperbola

B. a parabola

C. an ellipse

D. a circle

Answer: B

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109. In an ellipse the distance between the foci is 6 and minor axis is 8 . Then the eccentricity is

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

B. $\frac{1}{\sqrt{5}}$

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

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

Answer: C

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110. If $P = (x, y), F_1 = (3, 0), F_2 = (-3, 0)$ and $16x^2 + 25y^2 = 400$ then $PF_1 + PF_2 =$

A. 8

B. 6

C. 10

D. 12

Answer: C

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111. If tangents are drawn to the ellipse $x^2 + 2y^2 = 2$ then the locus of the midpoint

of the intercept made by the tangents between the coordinate axes is

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

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

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

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

Answer: A

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112. The area of the quadrilateral formed by the tangents at the end points of latus rectum to the ellipse $\frac{x^2}{9}+\frac{y^2}{5}=1$ is

A. $\frac{27}{4}$ (sq), units

B. 9 (sq). Units

C. $\frac{27}{2}$ sq. units

D. 27 (sq). Units

Answer: D

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113. A tangent is drawn at the point $\left(3\sqrt{3}\cos\theta, \sin\theta\right)$ for $0 < \theta < \frac{\pi}{2}$, of an ellipse $\frac{x^2}{27} + \frac{y^2}{1} = 1$. The least value of the sum of the intercepts on the coordinate axis by this tangent is attained at θ equal to

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

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

C. $\frac{3\pi}{8}$

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

Answer: A

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

A. a portion of a parabola

B. a parabola

C. a part of sine curve

D. a part of hyperbola

Answer: B

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115. The centre of the ellipse $\frac{(x+y-2)^2}{9}+\frac{(x-y)^2}{16}=1$ is

A. (0,0)

B. (1,1)

C. (1,0)

D. (0,1)

Answer: B

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116. If $\frac{x}{a}+\frac{y}{b}=\sqrt{2}$ touches the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ then its eccentric angle θ is equal to

A. 0°

B. 90°

C. 45°

D. 60°

Answer: C

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117. The eccentricity of the ellipse $9x^2 + 5y^2 - 30y = 0$ is

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

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

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

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

Answer: B

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118. If the major axis of an ellipse is 3 times its minor axis its ecentricity is

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

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

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

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

Answer: D

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119. A circle described with minor axis of an ellipse as a diameter. If the foci lie on the circle, the eccentricity of the ellipse is

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

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

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

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

Answer: B

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120. The equation of the ellipse whose one focus is at $(4, 0)$ and whose eccentricity is $\frac{4}{5}$ is

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

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

C. $\frac{x^2}{5} + \frac{y^2}{4} = 25$

D. $\frac{x^2}{4} + \frac{y^2}{5} = 1$

Answer: A

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121. The eccentricity of the ellipse $5x^2 + 9y^2 = 1$ is

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

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

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

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

Answer: A

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122. The curve represents by

$x = 2(\cos t + \sin t)$ and $y = 5(\cos t - \sin t)$ is

A. circle

B. a parabola

C. an ellipse

D. a hyperbola

Answer: C

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123. The eccentricity of the ellipse

$9x^2 + 5y^2 - 18x - 20y - 16 = 0$ is

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

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

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

D. 2

Answer: B

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124. The eccentricity of the conic $36x^2 + 144y^2 - 36x - 96y - 119 = 0$ is

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

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

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

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

Answer: A

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125. The sides of the rectangle of greatest area that can be inseribed in the ellipse $x^2 + 4y^2 = 64$ are

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

B. $8\sqrt{2}. 4\sqrt{2}$

C. $8\sqrt{2}, 8\sqrt{2}$

D. $16\sqrt{2}, 4\sqrt{2}$

Answer: B

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126. Equation of latus recta of the ellipse

$9x^2 + 4y^2 - 18x - 8y - 23 = 0$ are

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

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

C. y=1 pm sqrt(5)`

D. $x = -1 \pm \sqrt{5}$

Answer: C

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127. On the ellipse $4x^2 + 9y^2 = 1$, the point at which the tangent are parallel to $8x = 9y$ are

A. $\left(\frac{2}{5}, \frac{1}{5}\right)$ or $\left(-\frac{2}{5}, -\frac{1}{5}\right)$

B. $\left(-\frac{2}{5}, \frac{1}{5}\right)$ or $\left(\frac{2}{5}, -\frac{1}{5}\right)$

C. $\left(-\frac{2}{5}, -\frac{1}{5}\right)$

D. $\left(-\frac{3}{5}, -\frac{2}{5}\right)$ or $\left(\frac{3}{5} + \frac{2}{5}\right)$

Answer: B

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128. Equation of the circle passing through the intersection of ellipses $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and $\frac{x^2}{b^2}+\frac{y^2}{a^2}=1$ is

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

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

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

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

Answer: C

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129. 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 then the value of b^2 is

A. 1

B. 5

C. 7

D. 9

Answer: C

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130. The point (4,-3) with respect to the ellipse

$4x^2 + 5y^2 = 1$

A. lies on the curve

B. lies inside the curve

C. lies outside the curve

D. is focus of the curve

Answer: C

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131. Length of the axes of the conic

$9x^2 + 4y^2 - 6x + 4y + 1 = 0$ are

A. $\frac{1}{2}, 9$

B. $3, \frac{2}{5}$

C. $1, \frac{2}{3}$

D. 3,2

Answer: C

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132. If M_1 and M_2 are the feet of the perpendiculars from the foci S_1 and S_2 of the ellipse $\frac{x^2}{9} + \frac{y^2}{16} = 1$ on the tangent at any point P on the ellipse, then $(S_1M_1)(S_2M_2) =$

A. 16

B. 9

C. 4

D. 3

Answer: A

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133. The angle between the pair of tangents drawn from the point (1,2) to the ellipse $3x^2 + 2y^2 = 5$ is

A. $\tan^{-1}\left(\frac{12}{5}\right)$

B. $\tan^{-1}\left(\frac{6}{\sqrt{5}}\right)$

C. $\tan^{-1}\left(\frac{12}{\sqrt{5}}\right)$

D. $\tan^{-1}\left(\frac{6}{5}\right)$

Answer: C

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134. The equation $x^2 + 3y^2 - 9x + 2y + 1 = 0$ represents

A. an ellipse

B. a parabola

C. a hyperbola

D. a circle

Answer: A

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135. The equation of the ellipse having vertices at $(\pm 5, 0)$ and foci $(\pm 4, 0)$ is

A. $\frac{x^2}{25} + \frac{y^2}{16} = 1$

B. $4x^2 + 5y^2 = 50$

C. $9x^2 + 25y^2 = 225$

D. none of these

Answer: C

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136. The line $x + y = a$ will be a tangent to the ellipse $\frac{x^2}{9} + \frac{y^2}{16} = 1$, if a=

A. 8

B. ± 5

C. ± 10

D. ± 6

Answer: B

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137. Equation of the ellipse with eccentricity $\frac{1}{2}$ and foci at $(\pm 1, 0)$ is

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

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

C. $\frac{x^2}{4} + \frac{y^2}{3} = \frac{4}{3}$

D. none of these

Answer: B

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138. The equation $\frac{x^2}{2-\lambda}+\frac{y^2}{\lambda-5}-1=0$ represents an ellipse if

A. $\lambda < 2$

B. $\lambda > 5$

C. $2 < \lambda < 5$

D. $\lambda < 5$

Answer: A

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139. The number of values oif c such that the line $y = 4x + c$ touches the curve $\frac{x^2}{4} + y^2 = 1$ is

A. infinite

B. 0

C. 1

D. 2

Answer: D

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140. The eccentric angle of the point $(2, \sqrt{3})$ lying on $\frac{x^2}{16} + \frac{y^2}{4} = 1$ is

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

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

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

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

Answer: B

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141. If the focii of $\frac{x^2}{16}+\frac{y^2}{4}=1$ and $\frac{x^2}{a^2}-\frac{y^2}{3}$ =1 coincide, then value of a is

A. $\sqrt{3}$

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

C. 2

D. 3

Answer: D

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142. If the latus-rectum of the ellipse is half the minor axis, then its eccentricity is :

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

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

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

D. none of these

Answer: C

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143. If C is the centre and L and L' are the ends of the latus-rectum of the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$, then the area of the triangle CLL' is :

A. 4.8 (sq). units

B. 9.6 (sq) . Units

C. 19.6 (sq). Units

D. none of these

Answer: B

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144. The equation of auxiliary circle of the hyperbola $\frac{x^2}{4} - \frac{y^2}{9} = 1$ is

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

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

C. $x^2 + y^2 = 13$

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

Answer: A

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145. Let E be the ellipse $\frac{x^2}{9}+\frac{y^2}{4}=1$ and C be the circle $x^2+y^2=9$. Let P and Q be the points (1,2) and (2,1) respectively. Then,

A. Q lies inside C but outside E

B. Q lies outside both C and E

C. P lies inside both C and E

D. P lies inside C but outside E

Answer: D

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146. Let P be a variable point on the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ with foci S_1 and S_2. If A be the area of the triangle PS_1S_2, then the maximum value of A is :

A. ab

B. abe

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

D. $\frac{1}{2}$ a b e

Answer: B

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147. If $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is an ellipse and tangent at any point cuts the co-ordinate axes at P and Q, then the minimum area of triangle OPQ is :

A. ab

B. $\frac{a^3 + b^3 + ab}{3}$

C. $a^2 + h^2$

D. $\frac{a^2 + b^2}{4}$

Answer: A

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148. Let $P(x_1, y_1)$ and $Q(x_2, y_2), y_1 < 0, y_2 < 0$ be the end points of latus rectum of the ellipse $x^2 + 4y^2 = 4$. The equations of parabolas with latus rectum P Q are

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

B. $x^2 \pm 2\sqrt{3}y = 3 \pm \sqrt{3}$

C. $x^2 + 2\sqrt{3}y = \sqrt{3} \pm 3$

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

Answer: B

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149. The normal at a point P on the ellipse $x^2 + 4y^2 = 16$ meets the x-axisat Q. If M is the mid-point of the line segment PQ, then the locus of M intersects the latus-rectum of the given ellipse at the points :

A. $\left(\pm \frac{3\sqrt{5}}{2}, \pm \frac{2}{7} \right)$

B. $\left(\pm \frac{3\sqrt{5}}{2}, \pm \frac{\sqrt{19}}{4} \right)$

C. $\left(\pm 2\sqrt{3}, \pm \frac{1}{7} \right)$

D. $\left(\pm 2\sqrt{3}, \pm \frac{4\sqrt{3}}{7} \right)$

Answer: C

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150. The line passing through the extremity A of the major axis and extremity B of the minor axis of the ellipse $x^2 + 9y^2 = 9$ meets the auxiliary circle at the point M. Then the area of

the triangle with vertices A, M and the origin O is

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

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

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

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

Answer: D

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151. A focus of an ellipse is at the origin. The directrix is the line x=4 and the eccentricity is $\frac{1}{2}$. Then the length of the semi-major axis is

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

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

C. $\frac{8}{3}$

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

Answer: C

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

A. $4x^2 + 64y^2 = 48$

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

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

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

Answer: C

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153. Equation of the ellipse whose axes are the axes of co-ordinates and which passes through the point $(-3, 1)$ and has eccentricity $\sqrt{2/5}$ is :

A. $5x^2 + 3y^2 - 32 = 0$

B. $3x^2 + 5y^2 - 32 = 0$

C. $5x^2 + 3y^2 - 48 = 0$

D. $3x^2 + 5y^2 - 15 = 0$

Answer: B

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154. The foci of the ellipse $25(x+1)^2+9(y+2)^2=225$ are at

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

B. (-2,1) and (-2,6)

C. (-1,-2) and (-2,-1)

D. (-1,-2) and (-1,-6)

Answer: A

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155. The eccentricity of the ellipse $9x^2 + 5y^2 - 30y = 0$ is

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

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

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

D. none of these

Answer: B

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156. The eccentricity of an ellipse with centre at the origin which meets the straight line $\frac{x}{7}+\frac{y}{2}=1$ on the axis of x and the straight line $\frac{x}{3}-\frac{y}{5}=1$ on the axis of y and whose axes lie along the axes of coordinates is

A. $\frac{2\sqrt{6}}{7}$

B. $\frac{3\sqrt{2}}{7}$

C. $\frac{\sqrt{6}}{7}$

D. none of these

Answer: A

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157. The equation to the ellipse (referred to its axes as the axes of x and y respectively) whose foci are $(\pm 2, 0)$ and eccentricity $1/2,$ is

A. $\frac{x^2}{12} + \frac{y^2}{16} = 1$

B. $\frac{x^2}{16} + \frac{y^2}{12} = 1$

C. $\frac{x^2}{16} + \frac{y^2}{8} = 1$

D. none of these

Answer: B

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158. P is any point on the ellipse $9x^2 + 36y^2 = 324$ whose foci are S and S'. Sp + S'P =

A. 3

B. 12

C. 36

D. 324

Answer: B

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159. The line L x+m y+n=0 is a normal to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, if

A. $\frac{a^2}{m^2}+\frac{b^2}{l^2}=\frac{\left(a^2-b^2\right)^2}{n^2}$

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

C. $\frac{a^2}{l^2}-\frac{b^2}{m^2}=\frac{\left(a^2-b^2\right)^2}{n^2}$

D. none of these

Answer: B

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160. The angle between the pair of tangents drawn from the point (1,2) to the ellipse

$3x^2 + 2y^2 = 5$ is

A. $\tan^{-1}\left(\frac{12}{5}\right)$

B. $\tan^{-1}\left(\frac{6}{\sqrt{5}}\right)$

C. $\tan^{-1}\left(\frac{12}{\sqrt{5}}\right)$

D. $\tan^{-1}\left(12\sqrt{5}\right)$

Answer: C

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161. How many real tangents can be drawn to the ellipse $5x^2 + 9y^2 = 32$ from the point (2,3)?

A. 2

B. 1

C. 0

D. 3

Answer: A

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162. If two tangents drawn to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ intersect perpendicularly at P, then the locus of P is a circle $x^2+y^2=a^2+b^2$. The circle is called

A. circle

B. director circle

C. ellipse

D. none of these

Answer: B

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163. The foci of the conic $25x^2 + 16y^2 - 150x = 175$ are

A. $(0, \pm 2)$

B. $(0, \pm 1)$

C. $(0, \pm 3)$

D. $(3, \pm 3)$

Answer: C

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164. The equation of the ellipse whose distance between the foci is equal to 8 and distance between the directrices is 18, is

A. $5x^2 - 9y^2 = 180$

B. $9x^2 + 5y^2 = 180$

C. $x^2 + 9y^2 = 180$

D. $5x^2 + 9y^2 = 180$

Answer: D

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165. The eccentricity of the ellipse

$x^2 + 4y^2 + 8y - 2x + 1 = 0$ Is

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

B. $\frac{\sqrt{5}}{2}$

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

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

Answer: A

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166. The eccentricity of the conic

$4x^2 + 16y^2 - 24x - 32y = 12$ is

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

B. $\sqrt{3}$

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

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

Answer: C

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167. The radius of the circle passing through the foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$, and having its centre (0, 3) is :

A. 4

B. 3

C. $\sqrt{12}$

D. $\frac{7}{2}$

Answer: A

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168. The equation of the ellipse having vertices at $(\pm 5, 0)$ and foci $(\pm 4, 0)$ is

A. $\frac{x^2}{25} + \frac{y^2}{16} = 1$

B. $9x^2 + 25y^2 = 225$

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

D. $4x^2 + 5y^2 = 20$

Answer: B

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169. If theta is a parameter then

$x = a(\sin\theta + \cos\theta) y = b(\sin\theta - \cos\theta)$

represents,

A. an ellipse

B. a circle

C. a pair of lines

D. a hyperbola

Answer: A

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170. Length of the axes of the conic

$9x^2 + 4y^2 - 6x + 4y + 1 = 0$ are

A. $\frac{1}{2}, 9$

B. 3, $\frac{2}{5}$

C. 1, $\frac{2}{3}$

D. 3,2

Answer: C

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171. Length of the axes of the conic

$9x^2 + 4y^2 - 6x + 4y + 1 = 0$ are

A. $\frac{1}{2}, 9$

B. $3, \frac{2}{5}$

C. $1, \frac{2}{3}$

D. 3,2

Answer: C

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172. The product of the perpendiculars drawn from the two foci of an ellipse to the tangent at any point of the ellipse is

A. a^2

B. b^2

C. $4a^2$

D. $4b^2$

Answer: B

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