MATHS

BOOKS - S CHAND MATHS (ENGLISH)

CONIC SECTIONS

Examples

1. The vertex of the parabola $y^2 - 4y - 16x - 12 = 0$ is

A. (2,-1)

B. (-1,2)

C. (1,-2)

D. (1,2)

Answer: B

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2. The length of the latus - rectum of the parabola $4y^2 + 2x - 20y + 17 = 0$ is

A. 2

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

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

D. 4

Answer: C

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3. If the length of the major axis of an ellipse in 3 times the length of minor axis , then its eccentricity is

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

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

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

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

Answer: C

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4. 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 at (0,3) is

A. 4 units

B. 3 units

C. $\sqrt{12}$ units

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

Answer: A

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5. The eccentricity of the hyperbola whose latus-rectum is 8 and length of the conjugate axis is equal to half the distance between the foci, is

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

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

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

D. $2\sqrt{3}$

Answer: C

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6. The length of latus-rectum of the ellipse $3x^2 + 4y^2 - 6x + 8y - 5 = 0$ is

A. 3

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

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

D. none of these

Answer: A

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7. If the line 2x - 3y = k touches the parabola $y^2 = 6x$, then the value of k is

(i) $\frac{27}{4}$

(ii) $-\frac{27}{4}$

(iii) -27

(iv) 27

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

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

C. -27

D. 27

Answer: B

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Multiple Choice Questions

1. If a parabola has the origin as its focus and the line $x = 2$ as the directrix, then the coordinates of the vertex of the parabola are

A. (0,1)

B. (1,0)

C. (0,-1)

D. (-1,0)

Answer: B

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2. The equation of the parabola with vertex at origin and directrix the line y + 3 = 0 is

A. $y^2 = 12x$

B. $y^2 = -12y$

C. $x^2 = 12y$

D. $x^2 = -12y$

Answer: C

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3. The equation of parabola with focus at $(-3, 0)$ and directrix $x + 3 = 0$ is

A. $x^2 = 12y$

B. $x^2 = -12y$

C. $y^2 = 12x$

D. $y^2 = -12x$

Answer: C

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4. The equation of parabola through (-1,3) and symmetric with respect to x-axis and vertex at origin is (i) $y^2 = -9x$ (ii) $y^2 = 9x$ (iii) $y^2 = 3x$ (iv) $y^2 = -3x$

A. $y^2 = -9x$

B. $y^2 = 9x$

C. $y^2 = 3x$

D. $y^2 = -3x$

Answer: A

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5. 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 is

A. 12 sq. units

B. 16 sq. units

C. 18 sq.units

D. 24 sq. units

Answer: C

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6. If the parabola $y^2 = 4ax$ passes through the point (3,2) , then the length of its latus rectum is

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

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

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

D. 4

Answer: B

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7. In the parabola $y^2 = 4ax$, the length of the chord passing through the vertex and inclined to the x-axis at $\frac{\pi}{4}$ is

A. $4\sqrt{2}$ a units

B. $2\sqrt{2}$ a units

C. $\sqrt{2}$ a units

D. none of these

Answer: A

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8. The number of parabolas that can be drawn

, if two ends of the latus rectum are given, is

A. 1

B. 2

C. 3

D. 4

Answer: B

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9. If P is the point (1,0) and Q is any point on the parabola $y^2 = 8x$ then the locus of mid - point of PQ is

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

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

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

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

Answer: A

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10. The vertex of the parabola $y^2 + 8x - 2y + 17 = 0$ is (i) (1,-2) (ii) (-2,1) (iii) (1,2) (iv) (2,-1)

A. (1,-2)

B. (-2,1)

C. (1,2)

D. (2,-1)

Answer: B

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11. The length of latus - rectum of the parabola

$x^2 - 4x + 8y + 12 = 0$ is (i) 2 (ii) 4 (iii) 6 (iv) 8

A. 2

B. 4

C. 6

D. 8

Answer: D

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12. The equation of the parabola with focus (0,0) and directrix $x + y - 4 = 0$ is

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

B. $x^2 + y^2 - 2xy + 8x + 8y - 16 = 0$

C. $x^2 + y^2 + 8x + 8y - 16 = 0$

D. $x^2 + y^2 + 2xy - 8x - 8y + 16 = 0$

Answer: B

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13. The focus of the parabola $y^2 - x - 2y + 2 = 0$ is (i) $\left(\frac{5}{4}, 1\right)$ (ii)

$\left(\frac{1}{4}, 1\right)$ (iii) $\left(\frac{3}{4}, 1\right)$ (iv) (1,1)

A. $\left(\frac{5}{4}, 1\right)$

B. $\left(\frac{1}{4}, 1\right)$

C. $\left(\frac{3}{4}, 1\right)$

D. (1,1)

Answer: A

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14. The equation of the directrix of the parabola $x^2 - 4x - 8y + 12 = 0$ is

A. $y = 0$

B. $x - 1 = 0$

C. $y + 1 = 0$

D. $x + 1 = 0$

Answer: C

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15. The equation $x = t^2 + 1$ and $y = 2t + 1$, where t is any real number, are the parametric equation of the parabola

(i) $y^2 - 4x - 2y + 5 = 0$ (ii)

$y^2 + 4x - 2y + 5 = 0$ (iii)

$y^2 - 4x + 2y + 3 = 0$ (iv)

$y^2 - 4x - 2y - 5 = 0$

A. $y^2 - 4x - 2y + 5 = 0$

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

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

D. $y^2 - 4x - 2y - 5 = 0$

Answer: A

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16. If the latus rectum of an ellipse is equal to half of minor axis, then its eccentricity is

A. (a) $\frac{3}{2}$

B. (b) $\frac{1}{\sqrt{2}}$

C. (c) $\frac{\sqrt{3}}{2}$

D. (d) $\frac{1}{2}$

Answer: C

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17. If the eccentricity of and ellipse is $\frac{5}{8}$ and the distance between its foci is 10, then length of its latus rectum is

A. (a) $\frac{39}{4}$

B. (b) $\frac{39}{2}$

C. (c) $\frac{23}{2}$

D. (d) $\frac{23}{4}$

Answer: A

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18. The equation of ellipse whose foci are $(\pm 3, 0)$ and length of semi-major axis is 4 is

A. A. $\frac{x^2}{7} + \frac{y^2}{16} = 1$

B. B. $\frac{x^2}{16} + \frac{y^2}{7} = 1$

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

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

Answer: B

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19. The equation of ellipse whose vertices are $(\pm 5, 0)$ and foci are $(\pm 4, 0)$ is (i) $\frac{x^2}{16} + \frac{y^2}{9} = 1$ (ii) $\frac{x^2}{9} + \frac{y^2}{16} = 1$ (iii) $\frac{x^2}{25} + \frac{y^2}{9} = 1$ (iv) $\frac{x^2}{9} + \frac{y^2}{25} = 1$

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

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

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

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

Answer: C

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20. The length of latus rectum of the ellipse $3x^2 + y^2 = 12$ is (i) 4 (ii) 3 (iii) 8 (iv) $\frac{4}{\sqrt{3}}$

A. 4

B. 3

C. 8

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

Answer: D

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21. The equation of the hyperbola whose foci are $(0, \pm 13)$ and length of conjugate axis is 24 is (i) $144y^2 - 25x^2 = 3600$ (ii) $144x^2 - 25y^2 = 3600$ (iii) $25x^2 - 144y^2 = 3600$ (iv) $25y^2 - 144x^2 = 3600$

A. $144y^2 - 25x^2 = 3600$

B. $144x^2 - 25y^2 = 3600$

C. $25x^2 - 144y^2 = 3600$

D. $25y^2 - 144x^2 = 3600$

Answer: A

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22. The equation of the hyperbola with centre at the origin the length of transverse axis 6 and one focus is (0,4) is (i) $9x^2 - 7y^2 = 63$ (ii)

$7y^2 - 9x^2 = 63$ (iii) $9y^2 - 7x^2 = 63$ (iv)

$7x^2 - 9y^2 = 63$

A. $9x^2 - 7y^2 = 63$

B. $7y^2 - 9x^2 = 63$

C. $9y^2 - 7x^2 = 63$

D. $7x^2 - 9y^2 = 63$

Answer: B

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23. The equation of the hyperbola whose foci are $(\pm 4, 0)$ and length of latus rectum is 12 is

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

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

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

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

Answer: D

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24. The equation of the hyperbola whose vertices are at $(0, \pm 6)$ and eccentricity = $\frac{5}{3}$ is

(i) $16x^2 - 9y^2 = 576$ (ii) $16y^2 - 9x^2 = 576$

(iii) $9x^2 - 16y^2 = 576$ (iv) $9y^2 - 16x^2 = 576$

A. $16x^2 - 9y^2 = 576$

B. $16y^2 - 9x^2 = 576$

C. $9x^2 - 16y^2 = 576$

D. $9y^2 - 16x^2 = 576$

Answer: B

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25. The difference between the lengths of the major axis and the latus rectum of an ellipse is (i) ae (ii) 2ae (iii) ae^2 (iv) $2ae^2$

A. ae

B. 2ae

C. ae^2

D. $2ae^2$

Answer: D

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26. The sum of focal distances of any point on the ellipse $9x^2 + 16y^2 = 144$ is

A. 32 nits

B. 18 units

C. 16 units

D. 8 units

Answer: D

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27. The eccentricity of the hyperbola whose latus-rectum is 8 and length of the conjugate axis is equal to half the distance between the foci, is

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

B. $2\sqrt{\frac{1}{9}}$

C. $3\sqrt{\frac{1}{8}}$

D. 2

Answer: B

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28. The eccentricity of the conic $9x^2 + 25y^2 - 18x - 100y = 116$ is

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

B. B. $\frac{16}{25}$

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

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

Answer: C

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29. The length of latus-rectum of the hyperbola $x^2 - 2y^2 - 2x + 8y - 1 = 0$ is

(i) $\sqrt{6}$

(ii) $4\sqrt{3}$

(iii) 4

(iv) 3

A. $\sqrt{6}$

B. $4\sqrt{3}$

C. 4

D. 3

Answer: B

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30. If the equation $\frac{x^2}{3-\lambda}+\frac{y^2}{\lambda-8}+1=0$ represents an ellipse, then

(i) $\lambda < 8$

(ii) $\lambda > 3$

(iii) $3 < \lambda < 8$

(iv) $\lambda < 3 \text{ or } \lambda > 8$

A. $\lambda < 8$

B. $\lambda > 3$

C. $3 < \lambda < 8$

D. $\lambda < 3 \quad \text{or} \quad \lambda > 8$

Answer: C

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31. If the line x + y = 1 touches the parabola $y^2 = kx$, then the value of k is

A. A. 4

B. B. -4

C. C. 2

D. D. -2

Answer: B

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32. If the line y = x +k touches the ellipse $9x^2 + 16y^2 = 144,$ then

(i) k = 5 only

(ii) k = - 5 only

(iii) k = 5, - 5

(iv) none of these

A. k = 5 only

B. k = - 5 only

C. k = 5, - 5

D. none of these

Answer: C

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33. The equation $x^2 + 4xy + 4y^2 - 3x - 6 = 0$ represents

A. A. a circle

B. B. a parabola

C. C. an ellipse

D. D. a hyperbola

Answer: B

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