MATHS

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LOCUS

Solved Examples

1. Find the locus of the point which is at a constant distance of 5 units from (4,-3).

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2. The equation of the locus of the point whose distance from x - axis is twice its distance from the y - axis, is

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3. The locus of the point, for which the sum of the sqaures of distances from the coordinate axes is 25 is

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4. If the distances from P to the points $(3, 4), (-3, 4)$ are in the ratio $3:2$, then the locus of P is

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5. $A(2, 3), B(1, 5), C(-1, 2)$ are the three points . If P is a point such that $PA^2 + PB^2 = 2PC^2$, then find locus of P.

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6. The ends of the hypertenuse of right angled triangle are $(0, 6), (6, 0)$. The locus of the third vertex is

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7. A(1,1) , B (-2,3) are two points . If a point P forms a triangle of are 2 square units with A, B then find the locus of P.

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8. A(5,3) , B (3,-2),C(2,-1) are the three points . If P is a point such that the area of the quadrilateral PABC is 10 square units , then find the locus of P.

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9. A(a,0) , B(-a,0) are two point . If a point P moves such that $\angle PAB - \angle PBA = 2\alpha$ then find the locus of P .

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10. An iron rod of length 2l is sliding on two mutually perpendicular lines . Find the locus of the midpoint of the rod.

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11. A straight rod of length 9 unit, slides with its ends A, B always on the x and y axes repectively. Then the locus of the centroid of ΔOAB is

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12. Find the number of points in the locus represented by the equation $x^2 + y^2 = 0$

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13. Find the locus of the point which is at a constant distance of 5 units from (4,-3).

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14. Find the equation of locus of the point for which the sum of squares of distances from the

coordinate axes is 25

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15. If the distance from P to the points (3,4) and (-3,4) are in the ratio 3:2, find the locus of P.

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16. $A(2, 3), B(1, 5), C(-1, 2)$ are the three points. If P is a point moves such that $PA^2 + PB^2 = 2PC^2$, then the locus of P is

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17. The ends of the hypertenuse of right angled triangle are $(0, 6), (6, 0)$. The locus of the third vertex is

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18. $A(1, 1), B(-2, 3)$ are two points. If a point P forms a triangle of area 2 square units with A,B then find the locus of P.

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19. $A(5, 3), B(3, -2), C(2, -1)$ are three points. If P is a point such that the area of the quadrilateral PABC is 10 sq. unit, then the locus of P is

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20. An iron rod of length 2l is sliding on two mutually perpendicular lines. Find the locus of the midpoint of the rod.

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21. A straight rod of length 9 unit, slides with its ends A, B always on the x and y axes repectively. Then the locus of the centroid of ΔOAB is

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Advanced Analytical Solved Examples

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

of P is

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2. Equation of the locus of the centroid of the triangle whose vertices are $(a\cos k, a\sin k), (b\sin k, -b\cos k)$ and $(1, 0)$, where k is a perameter, is

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3. Find the equation of locus of point equidistant from the points $(a_1 b_1)$ and (a_2, b_2).

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4. The ends of a rod of length l move on two mutually perpendicular lines. The locus of the point on the rod which divides it in the ratio 1 : 2 is

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5. $p, x_1, x_2, \ldots x_n$ and $q, y_1, y_2, \ldots, y_n$ are two arithmetic progressions with common differences a and b respectively. If α and β are the arithmetic means of $x_1, x_2, \ldots . X_n,$ and $y_1, y_2, \ldots . Y_n$ respectivley . then the locus of $p(\alpha, \beta)$ is

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6. A (a,0) , B (-a,0) are two points . If a point P moves such that $\angle PAB - \angle PBA = \pi/2$ then find the locus of P.

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7. A(a,0) , B(-a,0) are two point . If a point P moves such that $\angle PAB - \angle PBA = 2\alpha$ then find the locus of P .

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8. The locus of the represented by $x = t^2 + t + 1, y = t^2 - t + 1$ is

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Exercise 2 1 Very Short Answer Questions

1. The locus of the point which is at a distance 5 unit from $(-2, 3)$ is

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2. Find the equation to the locus of the point for which the square of whose distance from origin is 4 times its y-coordinate.

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3. Find the equation to the locus of points equidistant from the points

(i) (-3,2), (0,4)

(ii) (a+b,a-b),(a-b,a+b)

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4. Find the equation to the locus of points equidistant from the points

(a + b,a - b),(a - b,a + b)

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5. The locus of the point which is equidistant to the coordinate axes is `

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6. The locus of the point whose distances to the coordinates axes arc in the ratio $2:3$ is

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7. Find the equation of locus of the point which is at a distance 5 unit from the Y-axis.

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8. Find the equation to the locus of a point P whose distance to (2,0)is equal to its distance from y-axis.

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9. The locus of P for which the distance from P to origin is double the distance from P to $(1, 2)$ is

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10. Find the locus of P If the distance of P from (3,0) is twice the distance of P from (-3,0)

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Exercise 2 1 Short Answer Questions

1. If the distance from 'P' to the points (2,3) and (2,-3) are in the ratio 2:3, then find the equation of the locus of P.

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2. If the distance from P to the points (5,-4) (7,6) are in the ratio 2 :3 , then find the locus of P.

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3. Find the locus of the point P such that $PA^2 + PB^2 = 2c^2$:where"A(a,0),B(-a,0) and $0 < |a| < |c|$.

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4. $A(1, 2), B(2, -3), C(-2, 3)$ are 3 points. A point P moves such that $PA^2 + PB^2 = 2PC^2$. Show that the equation to the locus of P is 7 x - 7y + 4 = 0 .

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5. Find the locus of a point P If the join of the points (2,3) and (-1,5) subtends a right angle at P.

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6. Find the the locus of the third vertex of a right angled triangle, the ends of whose hypotenuse are (4,0) and (0,4).

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7. A(2,3) B (-3,4)are two points P moves such that the area of ΔPAB is 8.5 square units, then find the locus of P

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8. A(5,3) B (3,-2) are two points . If a point P forms a triangle of area 9 square units with A,B then find the locus of P.

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9. O(0,0) A(6,0)and B(0,4)are three points .If P is a point such that the area of ΔPOB is twice the area of ΔPOA, then find the locus of P.

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10. Find the equation of locus of the points which is collinear with the points (3,4) and (-4,3).

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11. Find the equation of locus of a point, the sum of whose distances from (0 , 2) and (0 , -2) is 6 .

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12. Find the equation of the locus of P, if A=(2,3), B=(2,-3) and PA +PB =8.

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13. Find the equation locus of a point, the difference of whose distances from (-5,0) and (5,0) is 8

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14. Find the equation of locus of P if $A = (4, 0), B(-4, 0)$ and $|PA - PB| = 4$

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Advanced Subjective Type Questions

1. The position of moving point in xy plane at time 't' is given by $\left(u\cos\alpha t, u\sin\alpha\left(t-pt^2\right)\right)$ where u, α, p are constants . Find the equation of locus of the moving point.

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2. ABC is a variable triangle with a fixed centriod (5,5) the side BC = 13 and B,C move on x and y - axis respectively. Find the equation of locus of vertex 'A'.

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3. A line AB of length '2l' moves with the end 'A' always on x - axis and the end 'B' on the line y = 6x find the equation of locus of middle point of AB

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4. A and B are two fixed points and if the vertex 'C' of ΔABC moves such that

$\cot A + \cot B = k$, then show that locus of 'C' is a line parallel to AB.

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5. ΔABC is equilateral . P moves inside the triangle such that P in nearer to side BC than to the sides AB and AC. If locus of P gives a region then find its area, given that the side of ΔABC is 2 untis.

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6. Let A = (-2,0) , B = (2,0) and the point P moves such that $P = (a, a+1), a \in [-10, 10]$ and $\overline{AB}$ subtends acute angle at P then find the number of possible positions of P.

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7. Let O (0,0) and A (2,2) are given points . A point P moves such that it is nearer to O than A, then find the locus of P

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8. Let P(x,y) be a point which moves such that [x] = [y] where [] is greatest integer function, $0 \leq x \leq \frac{7}{2}, 0 \leq y \leq \frac{7}{2}$. If the locus of P constitutes a region , then find its area.

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9. Let P(x,y) moves such that the sum of its distances to the co - ordinate axes is at most 2. The set of all points P gives a region then find its area .

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10. Find the number of points , having both co-ordinates as integers , that lie in the interior of the triangle with vertices (0,0) , (0,41),(41,0)

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Additional Solved Examples

1. Find the Cartesian equation of the locus whose parametric equations are $x = a\cos\theta, y = a\sin\theta$ where θ is the parameter.

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2. Find the locus of the point $(a - b\sec\theta, a - b\tan\theta)$ where θ is the parameter.

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3. Find the locus of the piont $\left(a\cos^3\theta, b\sin^3\theta\right)$ where θ is the parameter.

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4. Find the locus of the point $(\cos ec\theta - \sin\theta, \sec\theta - \cos\theta), \theta$ is a parameter

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5. Find the locus of point

$(\tan\theta + \sin\theta, \tan\theta - \sin\theta)$ where θ is a parameter.

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9. Find the locus of P If the distance of P from (3,0) is twice the distance of P from (-3,0)

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Exercise 2 Short Answer Qustions

1. If the distance from P to the points $(2, 3), (2, -3)$ are in the ratio 2:3 the find the locus of P.

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2. Find the locus of P(x,y) which moves such that its distances from A(5,-4),B(7,6) are in the ratio 2:3.

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3. Find the locus of the point P such that $PA^2 + PB^2 = 2c^2$:where"A(a,0),B(-a,0) and $0 < |a| < |c|$.

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14. Find the equation of locus of P, if $A = (4, 0), B = (-4, 0)$ and $|PA - PB| = 4$

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Additional Exercise

1. Find the locus of the point (x,y) where

$x = a + b\cos\theta, y = b + a\sin\theta$

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2. Find the locus of the point (x,y) where

$x = a + b\sec\theta, y = b + a\tan\theta$

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3. The locus of the point $(a\sec\theta + b\tan\theta, b\sec\theta + a\tan\theta)$ where $0 \leq \theta < 2\pi$ is

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4. Find the locus of the point $\left(a\cos^4\theta, a\sin^4\theta\right)$ where θ is a parameter.

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5. Find the locus of point $\left(at^2, 2at\right)$ where t is a parameter.

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6. Find the locus of point $\left(ct, \frac{c}{t}\right)$ where t is a parameter.

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7. Find the locus of point $\left(a+bt, b-\frac{a}{t}\right)$ where t is a parameter.

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8. Find the locus of point $\left(t+\frac{1}{t}, t-\frac{1}{t}\right)$ where t is a parameter.

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Exercise I

1. The equation of the locus of the point whose distance from x-axis is twice its distance from the y-axis is

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

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

C. y=3x

D. 4x+y=0

Answer: 1

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2. The locus of a point whose distance from the y-axis is half of its distance from origin is

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

B. $x^2 = 3y^2$

C. $3x^2 = y^2$

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

Answer: 3

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3. The locus of the point for which the sum of the squares of distances from the corrdinate axes is 25 is

A. $x^2 + y^2 = 19$

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

C. $x^2 + y^2 = 32$

D. $x^2 + y^2 = 29$

Answer: 2

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4. If the equation to the locus of points equidistant from the points $(-2, 3), (6, -5)$ is $ax + by + c = 0$ where $a > 0$ then, the ascending order of a, b, c is

A. a,b,c

B. c, b, a

C. b, c, a

D. a, c, b

Answer: 2

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5. A(2, 1) and B(1, 2) are two points. If P is a point such that $PA : PB = 2 : 1$, then the locus of P is

A. $3x^2 + 3y^2 + 4x + 14y - 15 = 0$

B. $3x^2 + 3y^2 - 4x - 14y + 15 = 0$

C. $3x^2 + 3y^2 + 2x + 7y + 13 = 0$

D. $3x^2 + 3y^2 - 2x - 7y + 13 = 0$

Answer: 2

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6. Let $A(1, 0), B(-1, 0), C(2, 0)$ then the locus of a point P such that $PB^2 + PC^2 = 2PA^2$ is

A. a straight line parallel to x - axis

B. a straight line parallel to y-axis

C. parallel to x + y =2

D. xy=0

Answer: 2

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7. If $A(a, 0), B(-a, 0)$ then the locus of the point P such that $PA^2 + PB^2 = 2c^2$ is

A. $x^2 + y^2 + a^2 - c^2 = 0$

B. $x^2 + y^2 + a^2 + c^2 = 0$

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

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

Answer: 1

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8. The equation to the locus of P such that the join of (a, b) and (b, a) subtend a right angle at P, is

A. $x^2 + y^2 - ax - by + ab = 0$

B. $x^2 + y^2 - ax - by + 2ab = 0$

C. $x^2 + y^2 - (a + b)(x + y) + ab = 0$

D. $x^2 + y^2 - (a + b)(x + y) + 2ab = 0$

Answer: 4

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9. A line passes through a fixed point A(a, b). The locus of the foot of the perpendicular on it from origin is

A. $x^2 + y^2 + ax + by = 0$

B. $x^2 + y^2 - ax - by = 0$

C. $x^2 + y^2 - ax + by = 0$

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

Answer: 2

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10. The locus of a point which is collinear with the points (3, 4) and (-4, 3) is

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

B. $2x + 3y + 12 = 0$

C. $3x + 2y + 12 = 0$

D. $x - 7y + 25 = 0$

Answer: 4

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11. If $A = (6, 0), B = (0, 4)$ and O is the origin, then the locus of P such that the area of $\Delta POB = 2$ (area of ΔPOA) is

A. $x^2 - 3y^2 = 0$

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

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

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

Answer: 3

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12. The locus of P such that the area of ΔPAB is 12 sq. units where A(2, 2) and B(-4,5) is

A. $x^2 + 6xy + 9y^2 - 22x - 66y - 23 = 0$

B. $x^2 - 6xy + 9y^2 + 22x + 66y + 23 = 0$

C. $x^2 + 5xy + 9y^2 + 20x + 62y + 22 = 0$

D. $x^2 + 4y^2 + 4xy - 12x - 24y - 28 = 0$

Answer: 4

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13. The base of a triangle lies along the line x=a and is of length a. The area of the triangle is a^2. The locus of the third vertex is

A. $(x + a)(x - 3a) = 0$

B. $(x - a)(x + 3a) = 0$

C. $(x - a)(x - 3a) = 0$

D. $(x - a)(x - 2a) = 0$

Answer: 1

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14. $A(5, 3), B(3, -2), C(2, -1)$ are three points. If P is a point such that the area of the quadrilateral PABC is 10 sq. unit, then the locus of P is

A.

$$16x^2 - 24xy + 9y^2 - 144x + 108y - 76 = 0$$

B.

$$16x^2 + 24xy + 9y^2 + 144x + 108y + 76 = 0$$

C.

$$16x^2 + 24xy + 9y^2 - 144x + 108y - 76 = 0$$

D.

$$16x^2 + 24xy + 9y^2 + 144x + 108y - 76 = 0$$

Answer: 1

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15. A line segment of length 2l sliding with ends on the axes, then the locus of the middle point of the line segment is

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

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

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

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

Answer: 2

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16. A straight rod of length 3l unit slides with its ends A, B always on the x and y axes respectively. Then the locus of the centroid of ΔOAB is

A. $x^2 + y^2 = 3l^2$

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

C. $x^2 + y^2 = 4l^2$

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

Answer: 2

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17. Through (x_0, y_0) variable line is drawn cut ting the axes at A, B. If OACB is a rectangle then locus of C is

A. $\frac{x_0}{2x} + \frac{y_0}{2y} = 1$

B. $\frac{x_0}{x} + \frac{y_0}{y} = 1$

C. $\frac{x_0}{3x} + \frac{y_0}{3y} = 1$

D. $\frac{2x_0}{x} + \frac{2y_0}{y} = 1$

Answer: 2

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18. If h denote the arithmetic mean, k denote G.M. of the intercepts made on axes by the lines passing through (1, 1) then (h, k) lies on

A. $y^2 = 2x$

B. $y^2 = 4x$

C. y=2x

D. x+y=2xy

Answer: 1

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19. If a, b, c are in A.P., a, x, b are in G.P. and b, y, c are in G.P. the point (x, y) lies on

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

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

C. $x^2 - y^2 = 3b^2$

D. $x^2 + y^2 = 3b^2$

Answer: 1

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20. Let A = (2,5) and B = (4, -1) are two vertices of a AABC. Third vertex C moves along

$L = 9x + 7y + 4 = 0$. The locus of the centroid of triangle ABC is the line

A. 9x-7y-22=0

B. 9x+7y+22=0

C. 27x+21y-77=0

D. 27x+21y-78=0

Answer: 4

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21. A point moves in the xy - plane such that th sum of its, distances from two mutually perpendicular lines is always equal to 5 units. The area (in square units) enclosed by the locus of the point is

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

B. 25

C. 50

D. 100

Answer: 3

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22. If $A(a, 0), B(-a, 0)$ and $\angle APB = 45^\circ$, then the locus of P is

A. $x^2 + y^2 + 2ax + a^2 = 0$

B. $x^2 + y^2 - 2ax - a^2 = 0$

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

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

Answer: 4

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23. $A = (a, 0), B = (-a, 0)$, P is a moving point such that $\angle PAB - \angle PBA = \frac{\pi}{2}$. The locus of P is

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

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

C. $x^2 - 2y^2 = a^2$

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

Answer: 1

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24. The locus of a point such that the sum of its distances from the points $(0, 2)$ and $(0, -2)$ is 6 is

A. $9x^2 - 5y^2 = 45$

B. $5x^2 + 9y^2 = 45$

C. $9x^2 + 5y^2 = 45$

D. $5x^2 - 9y^2 = 45$

Answer: 3

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25. A point P moves so that the sum of its distance from the points (ae, 0), (-ae, o) is 2a. The locus of the point P is $(0 < e < 1)$

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

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

C. $\frac{x^2}{a^2} - \frac{y^2}{a^2(1-e^2)} = 1$

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

Answer: 4

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26. The perimeter of triangle is 14 units and two of its vertices are (-3,0), (3, 0) then the locus of the 3rd vertex is

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

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

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

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

Answer: 1

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27. $A(2, 3), B(-2, 3)$ are two points. The locus of P which moves such that $PA - PB = 4$ is

A. $y + 3 = 0, x \in (-2, 2)$

B. $y - 3 = 0, x \in R - (-2, 2)$

C. y-5=0

D. $y^2 - 3 = 0$

Answer: 2

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28. The locus of the point represented by $x = \cos^2 t, y = 2\sin t$ is

A. $y^2 = 4x$

B. $y^2 = 4x + 1$

C. $y^2 + 4x = 1$

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

Answer: 4

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29. The locus of the point $(\sec\theta + \tan\theta, \sec\theta - \tan\theta)$ where θ is parameter, is

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

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

C. $xy = 1$

D. $xy + 1 = 0$

Answer: 3

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30. The locus of the point $(a(\cos\theta+\sin\theta), b(\cos\theta-\sin\theta))$, where θ is the parameter, is

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

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

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

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

Answer: 4

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31. If (p,q), $(a\cos\theta, b\sin\theta)$, $(b\cos\theta, a\sin\theta)$ are the vertices of a triangle, where θ is a parameter then the locus of the centriod of the triangle

A. $(3x-p)^2+(3y-q)^2=(a+b)^2$

B. $x^2+y^2=9(a+b)^2$

C. $(3x+p)^2+(3y+q)^2=(a+b)^2$

D. $x(x-a)+y(y+b)=0$

Answer: 1

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32. The locus of the centroid of the triangle with vertices at $(a\cos\theta, a\sin\theta), (b\sin\theta, -b\cos\theta)$ and (1,0) is (Here θ is a parameter)

A. $(3x-1)^2+9y^2=a^2+b^2$

B. $(3x+1)^2+9y^2=a^2+b^2$

C. $(3x+1)+9y^2=a^2+b^2$

D. $(3x-1)^2+9y^2=a^2-b^2$

Answer: 1

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33. The locus of the point $x = a + \lambda^2, y = b - \lambda$ where λ is a parameter is

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

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

C. $x + a = y^2$

D. $x - a = y^2$

Answer: 2

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34. The locus represented by $x = \frac{a}{2}\left(t + \frac{1}{t}\right), y = \frac{a}{2}\left(t - \frac{1}{t}\right)$ is

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

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

C. $2x^2 - y^2 = a^2$

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

Answer: 2

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35. Statement-I : Let $A(0, 0), B(\cos\alpha, \sin\alpha), C(\sin\alpha - \cos\alpha)$ are vertices of a trianlge then the locus of the centroid of triangle is $9x^2 + 9y^2 = 4$

Statement-II : The locus of the point $(a\cos\theta, b\sin\theta)$ is $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ The correct statement is

A. only I

B. only II

C. both I and II

D. neither I nor II

Answer: 2

36. Let P(x, y) be any point on the locus then observe the following lists

List - I	List - II
A) The sum of the squares of distance from the coordinate axis is 25	1) $x^2 + y^2 = 25$
B) distances to the coordinate axes are in the ratio 2 : 3 respectively	2) $4x^2 - 9y^2 = 0$
C) The square of whose distance from origin is 4 times its y-coordinate	3) $x^2 + y^2 = 4y$
D) distance from P to $(4, 0)$ is double the distance from P to the x-axis	4) $x^2-3y^2-8x+16=0$
	5) $9x^2 - 4y^2 = 0$

The correct matching is

A.

A	B	C	D
1	2	3	4

B.

A	B	C	D
1	5	3	4

C.

A	B	C	D
1	2	4	3

D.

A	B	C	D
2	1	3	5

Answer: 1

37. Find the equation to the locus of points equidistant from the points

(-3,2),(0,4)

A. A true, R true and R is correct explanation of A

B. A true, R true but R is not correct explanation of A

C. A true, R false

D. A false, R true

Answer: 1

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38. The line joning (5,0) and $(10\cos\theta, 10\sin\theta)$ is divided internally in the ratio 2:3 at P. Then locus of P is

A. a pair of straight lines

B. straight line

C. a circle

D. a parabola

Answer: 3

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39. The locus given by

$16x^2 - 24xy + 9y^2 - 62x + 34y + 46 = 0$ is

A. pair of lines

B. circle

C. parabola

D. Hyperbola

Answer: 3

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40. The locus given by $25x^2 + 16y^2 = 400$ is

A. hyperbola

B. ellipse

C. parabola

D. circle

Answer: 2

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41. The locus given by $2x^2 - y^2 = 4a^2$ is

A. pair of lines

B. circle

C. ellipse

D. Hyperbola

Answer: 4

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42. The equation $\sqrt{(x-2)^2+y^2}+\sqrt{(x+2)^2+y^2}=4$ represents

A. a pair of lines

B. a parbola

C. a line sement

D. a circle

Answer: 3

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43. A and B are fixed points of $PA + PB = K$ constant) and $K > AB$ then the locus of P is

A. Hyperbola

B. an ellipse

C. Parabola

D. a circle

Answer: 2

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44. Equation of the locus of the centroid of the triangle whose vertices are $(a\cos k, a\sin k), (b\sin k, -b\cos k)$ and (1,0) where k is a p arameter is

A. $(1-3x)^2+9y^2=a^2+b^2$

B. $(3x-1)^2+9y^2=2a^2+2b^2$

C. $(3x+1)^2+(3y)^2=a^2+b^2$

D. $(3x+1)^2+(3y)^2=3a^2+3b^2$

Answer: 1

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45. If A(5, 4) and B(7, 6) are points in a plane, then the set of all points P(x, y) in the plane such that AP : PB = 2:3 is

A. a circle

B. a hyperbola

C. an ellipse

D. a parabola

Answer: 1

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Practice Exercise

1. The locus of the point which is equidistant to the coordinate axes is `

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

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

C. $x + y = 0$

D. $x - y = 0$

Answer: 2

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2. The locus of a point whose distance from y-axis is one-third of its distance from origin is

A. $y^2 = 8x^2$

B. $8y^2 = x^2$

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

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

Answer: 1

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3. The equation to the locus of points equidistant from the points $(-3, 4), (3, 4)$ is

A. x=1

B. x=2

C. x=3

D. x=0

Answer: 4

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4. If the equation of the locus of a point equidistant from the points (a_1, b_1) and (a_2, b_2) is $(a_1 - a_2)x + (b_1 - b_2)y + c = 0$ then the value of c is

A. $\sqrt{a_1^2 + b_1^2 - a_2^2 - b_2^2}$

B. $\frac{1}{2}(a_2^2 + b_2^2 - a_1^2 - b_1^2)$

C. $a_1^2 - a_2^2 + b_1^2 - b_2^2$

D. $\frac{1}{2}(a_1^2 + a_2^2 + b_1^2 + b_2^2)$

Answer: 2

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5. The equation to the locus of points equidistant from the points $(-2, 3), (6, -5)$ is $ar + by + c = 0$ then increasing order of a, b, c is

A. a, b, c

B. c, b, a

C. b, c, a

D. a, c, b

Answer: 2

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6. $A(-9, 0)$ and $B(-1, 0)$ are two points. If $P(x, y)$ is a point such that $3PB = PA$, then the locus of P is

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

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

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

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

Answer: 3

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7. $A(2, 3), B(1, 5), C(-1, 2)$ are three points and $PA^2 + PB^2 = 2PC^2$ then locus of P is

A. $10x + 8y - 29 = 0$

B. $10x + 8y + 29 = 0$

C. $10x - 8y + 29 = 0$

D. $10x - 8y - 29 = 0$

Answer: 1

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8. Let $P(2, 0), Q(-2, 0)$ and $R(4, 0)$ then the locus of S such that $SQ^2 + SR^2 = 2SP^2$ is

A. a straight line parallel to x-axis

B. a straight line parallel to y-axis

C. x + y = 4

D. xy=0

Answer: 2

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9. The point P moves such that the sum of the squares of its distances from two fixed points $A(a, 0), B(-a, 0)$ is $8a^2$ the locus of P is

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

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

C. $x^2 + y^2 = 3a^2$

D. $x^2 + y^2 = 6a^2$

Answer: 3

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10. $A(2, 3), B(-1, 1)$ are two points if P is a point such that $\angle APB = 90^\circ$ then the locus of P is

A. $x^2 + y^2 - x - 4y + 1 = 0$

B. $x^2 + y^2 + x + 4y - 1 = 0$

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

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

Answer: 1

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11. A line passes through a fixed point A(h, k). The locus of the foot of the perpendicular on it from origin is

A. 1) $x^2 + y^2 + hx + ky = 0$

B. 2) $x^2 + y^2 - hx - ky = 0$

C. 3) $x^2 + y^2 - kx - hy = 0$

D. 4) $x^2 + y^2 + kx + hy = 0$

Answer: 2

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12. The locus of a point which is collinear with the points A(3, 4) and B(4, 3) is

A. 1)x+y-7=0

B. 2)x+y+7=0

C. 3)x-y=7

D. 4)x-y+7=0

Answer: 1

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13. $O(0,0), A(4,0), B(0,6)$ are the points. If P is a point such that the area of ΔPOB is twice the area of ΔPOA, then the locus of P is

A. 1)$2x^2 = 3y^2$

B. 2)$3x^2 = 4y^2$

C. 3)$9x^2 = 16y^2$

D. 4)$4x^2 = 9y^2$

Answer: 3

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14. $A(2, 3), B(-3, 4)$ are two points. If a point P moves such that the area of ΔPAB is 8.5 sq. units, then locus of P is

A. $x^2 + 10xy + 25y^2 - 34x - 170y = 0$

B. $x^2 + 10xy - 25y^2 - 34x - 170y = 0$

C. $x^2 - 10xy + 25y^2 - 34x + 170y = 0$

D. $x^2 - 10xy - 25y^2 + 34x + 170y = 0$

Answer: 1

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15. $A(1, 1), B(2, 3), C(-1, 1)$ are the points. If P is a point such that the area of the quadrilateral PABC is 3 sq. units, then the locus of P is

A. $y^2 + 6y = 0$

B. $y^2 - 6y = 0$

C. $x^2 + 6x = 0$

D. $x^2 - 6x = x$

Answer: 2

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16. A line segment of length 10 sliding with ends on the axes, then the locus of middle point of the line segment is

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

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

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

D. $x^2 + y^2 = 50$

Answer: 3

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17. A straight rod of length 9 unit, slides with its ends A, B always on the x and y axes repectively. Then the locus of the centroid of ΔOAB is

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

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

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

D. $x^2 + y^2 = 81$

Answer: 2

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18. Sum of the distances of a point from two perpendicular lines is 3. The area enclosed by the locus of the point is

A. 18

B. 16

C. 4

D. 15

Answer: 1

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19. Let $A(1, 2), B(3, 4)$ are two vertices of a ΔABC. The third vertex C moves along $L = 7x + 5y - 10 = 0$. The locus of the centroid of ΔABC is

A. $21x + 15y - 68 = 0$

B. $7x + 5y - 4 = 0$

C. $7x + 5y + 68 = 0$

D. $7x + 5y - 17 = 0$

Answer: 1

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20. From a point P perpendiculars PM and PN are drawn upon x, y axes respectively. If MN passes through a fixed point (a, b) then the locus of P is

A. $\frac{x}{a}+\frac{y}{b}=1$

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

C. $\frac{a}{x}+\frac{b}{y}=1$

D. $\frac{a}{x}-\frac{b}{y}=1$

Answer: 3

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21. Let $A(2, -3), B(-2, 1)$ be vertices of a triangle ABC. If the centroid of this triangle moves on the line $2x + 3y = 1$, then locus of the vertex 'C' is the line

A. $3x + 2y = 5$

B. $2x - 3y = 7$

C. $2x + 3y = 4$

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

Answer: 4

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22. If $A(3, 0)$ and $B(-3, 0)$ are two points and $PA + PB = 10$, then the locus of P where P is any point (x, y) is

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

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

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

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

Answer: 4

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23. $A(2, 3), B(2, -3)$ are two points. The equation to the locus of P such that $PA + PB = 8$ is

A. $16x^2 + 7y^2 - 64x - 48 = 0$

B. $16x^2 + 7y^2 - 64x + 48 = 0$

C. $16x^2 - 7y^2 + 64x - 48 = 0$

D. $16x^2 - 7y^2 + 64x + 48 = 0$

Answer: 1

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24. $A(2, 0), B(-2, 0)$ are two points. The locus of the point P which moves such that $PA - PB = 2$ is

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

B. $3x^2 - y^2 = 3$

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

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

Answer: 2

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25. $A = (0, 5), B = (0, -5)$ are the points and $|AP - PB| = 8$ then the locus of P is

A. $16x^2 - 9y^2 + 144 = 0$

B. $16x^2 + 9y^2 + 144 = 0$

C. $x^2 + 9y^2 + 144 = 0$

D. $16x^2 - 9y^2 - 144 = 0$

Answer: 1

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26. If $A = (0, 4), B = (0, -4)$ and $|AP - PB| = 6$, then the locus of P is

A. $7x^2 - 9y^2 + 63 = 0$

B. $9x^2 - 7y^2 + 63 = 0$

C. $7x^2 - 9y^2 - 63 = 0$

D. $9x^2 - 7y^2 - 63 = 0$

Answer: 2

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27. The locus of the point $(\cos ec\theta + \cot\theta, \cos ec\theta - \cot\theta)$ is

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

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

C. $xy = 1$

D. $xy + 1 = 0$

Answer: 3

View Text Solution

28. Locus of centroid of the triangle whose vertices are

$(a\cos\theta, a\sin\theta), (b\sin\theta, -b\cos\theta)$ and (2,0)

where θ is a parameter is

A. $(3x-2)^2 + y^2 = a^2 + b^2$

B. $(3x-2)^2 + 3y^2 = a^2 + b^2$

C. $(3x-2)^2 + 9y^2 = a^2 + b^2$

D. $(3x-2)^2 + 9y^2 = a^2 - b^2$

Answer: 3

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29. Statement-I : The locus of the point, whose distance from the X-axis is twice its distance from the y-axis is $y^2 = 4x$

Statement-II : The locus of the point $(\cot\theta + \cos\theta, \cot\theta - \cos\theta)$ is $\left(x^2 - y^2\right)^2 = 16xy$ Then the correct statement is

A. only I

B. only II

C. both I and II

D. neither I nor II

Answer: 2

View Text Solution

30. $A(2, 3), B(1, 5), C(-1, 2)$ are three points. If P is a point moves such that $PA^2 + PB^2 = 2PC^2$ then locus of P is $lx + my + n = 0$. Then decreasing order of l,m,n

A. l, n, m

B. l, m, n

C. m, n, l

D. n, l, m

Answer: 2

31. Vertices of the triangle ('t' being parameter) are given in list-I and locus of the respective centroids is given in list-II. Match the two lists.

LIST - I	LIST - II
A) $A(1,2), B(-2,-2), C(2t,t)$	i) $6x - 3y - 5 = 0$
B) $A(2,3), B(-2,0), C(t,t)$	ii) $6x - 3y - 7 = 0$
C) $A(t,2t), B(3,0), C(0,1)$	iii) $3x - 3y - 4 = 0$
D) $A(-1,-1), B(-t,-t), C(4,0)$	iv) $3x - 6y + 1 = 0$
	v) $x - y + 1 = 0$

The correct matching is

A. $\begin{matrix} A & B & C & D \\ v & iii & ii & i \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ i & ii & v & iv \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ iv & v & i & iii \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ i & ii & iii & iv \end{matrix}$

Answer: 3

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32. Assertion (A): The sum of the distances of a point from two perpendicular lines is 1, then its locus is a square

Reason (R): The locus of a point which is at a distance 'p' from the given point is a circle

A. A true, R true and R is correct explanation of A

B. A true, R true but R is not a correct explanation of A

C. A true, R false

D. A false, R true

Answer: 2

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33. The equation $x^2 + y^2 - 2x - 4y - 5 = 0$ represents a

A. circle

B. pair of straight lines

C. ellipse

D. a point

Answer: 1

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34. The locus represented by the equation $x^2 + y^2 + 4x + 2y - 8 = 0$ is

A. hyperbola

B. circle

C. ellipse

D. parabola

Answer: 4

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35. The locus given by $x^2 - y^2 + x + y - 1 = 0$ is

A. circle

B. hyperbola

C. ellipse

D. pair of lines

Answer: 2

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36. The locus of the point $(a\cosh x, b\sin hx)$ is

A. Circle

B. Ellipse

C. Hyperbola

D. Parabola

Answer: 3

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37. A and B are fixed points of $|PA - PB| = K$ (constant) and $K < AB$ then the locus of P is

A. Hyperbola

B. an ellipse

C. straight line

D. a circle

Answer: 1