



## MATHS

### BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

## LOCUS

#### Solved Examples

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

A.  $5x^2 + 5y^2 - 12x - 86y + 17 = 0$

B.  $5x^2 + 5y^2 - 34x + 120y + 29 = 0$

C.  $5x^2 + 5y^2 - 5x + y + 14 = 0$

D.  $5x^2 + 5y^2 + 78x - 40y + 125 = 0$

**Answer: D**



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

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

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

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

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

**Answer: B**



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3.  $A(1, -1)$ ,  $B(5, 2)$  are two points. If a point  $P$  forms a triangle of area 5 sq. Unit with  $A$ ,  $B$  then the locus of  $P$  is

A.  $9x^2 + 24xy - 16y^2 + 42x + 56y - 51 = 0$

B.  $9x^2 + 24xy - 16y^2 - 42x + 56y - 51 = 0$

C.  $9x^2 - 24xy + 16y^2 - 42x + 56y - 51 = 0$

D.  $9x^2 - 24xy + 16y^2 + 42x + 56y - 51 = 0$

**Answer: C**



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4. The locus of point of intersection of the lines  $y + mx = \sqrt{a^2m^2 + b^2}$  and  $my - x = \sqrt{a^2 + b^2m^2}$  is

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

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

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

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

**Answer: B**



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5. From a point P, perpendiculars PL and PM are drawn upon X and Y axes respectively. If LM passes through a fixed point  $(x_1, y_1)$  then the locus of P is

A.  $\frac{x_1}{x} - \frac{y_1}{y} = 1$

B.  $\frac{x_1}{x} + \frac{y_1}{y} = 1$

C.  $\frac{x}{x_1} - \frac{y}{y_1} = 1$

D.  $\frac{x}{x_1} + \frac{y}{y_1} = 1$

**Answer: B**



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6. If the roots of the equation  $(x_1^2 - a^2)m^2 - 2x_1y_1m + (y_1^2 + b^2) = 0$ ,  $(a > b)$  are the slopes of two perpendicular lines intersecting at  $P(x_1, y_1)$ , then the locus of P is

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

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

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

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

**Answer: B**



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7. A line passes through a fixed point  $(a, b)$ . 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: B**

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## Exercise 1 Multiple Choice Questions

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

A.  $x^2 - y^2 + 4x - 6y + 12 = 0$

B.  $x^2 + y^2 + 4x - 6y - 12 = 0$

C.  $x^2 - y^2 + 4x - 6y - 12 = 0$

D.  $x^2 + y^2 + 4x - 6y + 12 = 0$

**Answer: B**

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2. The locus of  $P(x, y)$  such that its distance from  $A(0, 0)$  is less than 5 units is

A.  $x^2 + y^2 < 5$

B.  $x^2 + y^2 < 10$

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

D.  $x^2 + y^2 < 20$

**Answer: C**

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3. The locus of the point which is at a distance 5 unit from x - axis is

A.  $y^2 + 25 = 0$

B.  $y^2 - 25 = 0$

C.  $y + 25 = 0$

D.  $y - 25 = 0$

**Answer: B**

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

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

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

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

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

**Answer: A**



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5. The locus of the point whose distances to the coordinate axes are in the ratio 2:3 is

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

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



C.  $4x^2 - 16y^2 = 0$

D.  $4x^2 - 9y^2 = 0$

**Answer: D**



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6. 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: B**



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7. 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: A**



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8. The equation to the locus of points equidistant from the points  $(2, 3)$ ,  $(-2, 5)$  is

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

B.  $2x - y - 1 = 0$

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

$$D. 2x + y + 1 = 0$$

**Answer: A**



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

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

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

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

**Answer: A**



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10. The equation to the locus of a point P for which the distance from P to (4, 0) is double the distance from P to  $x$  - axis is

A.  $x^2 + 3y^2 + 8x + 16 = 0$

B.  $x^2 + 3y^2 - 8x - 16 = 0$

C.  $x^2 - 3y^2 + 8x - 16 = 0$

D.  $x^2 - 3y^2 - 8x + 16 = 0$

**Answer: D**



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11. A point moves so that its distance from  $y$  - axis is half of its distance from the origin. The equation to the locus is

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

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

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

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

**Answer: B**



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

A.  $3x^2 + 3y^2 - 8x - 16y + 20 = 0$

B.  $3x^2 + 3y^2 - 8x + 16y + 20 = 0$

C.  $3x^2 - 3y^2 - 8x - 16y + 20 = 0$

D.  $3x^2 - 3y^2 - 8x + 16y + 20 = 0$

**Answer: A**



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13.  $A(-9, 0)$ ,  $B(-1, 0)$  are two points. If  $P$  is a point such that  $PA:PB = 3:1$ , 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.  $x^2 - y^2 + 9 = 0$

**Answer: A**



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14. The locus of the moving point  $P$ , such that  $2PA = 3PB$  where  $A(0, 0)$ ,  $B(4, -3)$  is

A.  $5x^2 + 5y^2 - 72x + 54y + 225 = 0$

B.  $5x^2 + 5y^2 + 72x - 54y - 225 = 0$

C.  $3x^2 + 3y^2 - 70x + 52y + 225 = 0$

D. none of these

**Answer: A**



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15.  $A(2, 3)$ ,  $B(3, -4)$  are two points. The locus of the point P such that  $PA^2 + PB^2 = 10$  is

A.  $x^2 - y^2 + 5x + y + 14 = 0$

B.  $x^2 + y^2 - 5x + y - 14 = 0$

C.  $x^2 - y^2 + 5x - y + 14 = 0$

D.  $x^2 + y^2 - 5x + y + 14 = 0$

**Answer: D**



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

**Answer: B**



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17. The point P moves such that the sum of the squares of its distances from two fixed points  $A(a, 0)$  and  $B(-a, 0)$  is constant and equal to  $6a^2$ . The locus of P is

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

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



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

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

**Answer: C**

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18. Sum of the squares of the distances from a point to  $(c, 0)$  and  $(-c, 0)$  is  $4c^2$ . Its locus is

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

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

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

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

**Answer: C**

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

A.  $7x - 7y + 4 = 0$

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

C.  $7x + 7y + 4 = 0$

D.  $7x - 7y - 4 = 0$

**Answer: A**



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20. The ends of the hypotenuse of right angled triangle are  $(0, 6)$ ,  $(6, 0)$

. The locus of the third vertex is

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

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

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

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

**Answer: A**



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21.  $A(2, 3), B(-1, 1)$  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: A**



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22. The locus of P such that area of  $\Delta PAB$  is 12 square units where  $A = (2, 3)$  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.  $x^2 + 6xy + 9y^2 - 22x - 66y - 23 = 0$

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

**Answer: C**



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23.  $O(0, 0)$ ,  $A(6, 0)$ ,  $B(0, 4)$  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.  $x^2 - 9y^2 = 0$

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

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

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

**Answer: A**



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24.  $A(5, 3)$ ,  $B(3, -2)$ ,  $C(2, -1)$  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: B**



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25. 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: C**



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26.  $A(2, 3)$ ,  $B(2, -3)$  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: A**



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27.  $A(a, 0)$ ,  $B(-a, 0)$  are two points. The equation to the locus of P such that  $PA + PB = c$  is

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

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

C.  $2(c^2 + 2a^2)x^2 + 2c^2y^2 = c^2(c^2 + 4a^2)$

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

**Answer: A**



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28.  $A(ae, 0)$ ,  $B(-ae, 0)$  are two points. The equation to the locus of P such that  $PA - PB = 2a$  is

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: A**



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

A.  $y + 3 = 0$

B.  $y - 3 = 0$

C.  $y^2 + 3 = 0$



D.  $y^2 - 3 = 0$

**Answer: B**



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30.  $A(0, 4)$ ,  $B(0, -4)$  are two points. The locus of P which moves such that  $|AP - PB| = 6$  is

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

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

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

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

**Answer: A**



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31. The perimeter of a triangle is 20 and the points  $(-2, 3)$  and  $(-2, 3)$  are two of the vertices of it. The locus of the third vertex is

A.  $\frac{(x+2)^2}{40} + \frac{y^2}{49} = 1$

B.  $\frac{(x-2)^2}{40} + \frac{y^2}{49} = 1$

C.  $\frac{(x+2)^2}{49} + \frac{y^2}{40} = 1$

D. none

Answer: A



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32. 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: B**



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**33.** The locus of the point  $(a \cos \theta, b \sin \theta)$  where  $0 \leq \theta < 2\pi$  is

A.  $\sqrt{x} + \sqrt{y} = \sqrt{ab}$

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

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

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

**Answer: C**



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**34.** The locus of the point  $(a \cos h\theta, b \sin h\theta)$  is

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

$$\text{B. } \sqrt{\frac{x}{a}} + \sqrt{\frac{y}{b}} = 1$$

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

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

**Answer: C**



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

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

$$\text{B. } \sqrt{\frac{x}{a}} + \sqrt{\frac{y}{b}} = 1$$

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

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

**Answer: C**



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36. The locus of the point  $(a \cos \theta + b \sin \theta, a \sin \theta - b \cos \theta)$  where  $0 \leq \theta < 2\pi$  is

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

B.  $(x^2 - y^2)^2 = 16xy$

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

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

**Answer: A**



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

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

B.  $(x^2 - y^2)^2 = 16xy$

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

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

**Answer: D**



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**38.** The locus of the point  $(a \cos^3 \theta, b \sin^3 \theta)$  where  $0 \leq \theta < 2\pi$  is

$$A. (x^2 y)^{2/3} + (x y^2)^{2/3} = 1$$

$$B. (x^2 y^2)^{2/3} + (x y^2)^{2/3} = 1$$

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

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

**Answer: C**



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39. If a point  $(x, y) = (\tan \theta + \sin \theta, \tan \theta - \sin \theta)$ , then the locus of  $(x, y)$  is

A.  $(x^2y)^{2/3} + (xy^2)^{2/3} = 1$

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

C.  $x^2 - y^2 = 12xy$

D.  $(x^2 - y^2)^2 = 16xy$

**Answer: D**



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40. The locus of the point  $(\cot \theta + \cos \theta, \cot \theta - \cos \theta)$  where  $0 \leq \theta < 2\pi$  is

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

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

C.  $(x^2 + y^2)^2 = 16xy$

$$D. (x^2 - y^2)^2 = 16xy$$

**Answer: D**



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41. The locus of the point  $(\cos ec\theta - \sin\theta, \sec\theta - \cos\theta)$  where  $0 \leq \theta < 2\pi$  is

A.  $(x^2y)^{2/3} + (xy^2)^{2/3} = 1$

B.  $(x^2y^2)^{2/3} + (xy^2)^{2/3} = 1$

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

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

**Answer: A**



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42. The locus of the point represented by  $x = 3(\cos t + \sin t)$ ,  $y = 2(\cos t - \sin t)$  is

A.  $\frac{x^2}{9} + \frac{y^2}{4} = 1$

B.  $\frac{x^2}{4} + \frac{y^2}{9} = 1$

C.  $\frac{x^2}{18} + \frac{y^2}{8} = 1$

D.  $\frac{x^2}{8} + \frac{y^2}{18} = 1$

**Answer: C**



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43. The locus of the point represent 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: D**



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

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

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

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

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

**Answer: A**



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**45.** The locus of the point represented by

$x = 1 + 4 \cos \theta$ ,  $y = 2 + 3 \sin \theta$  is

A.  $9(x - 1)^2 - 16(y - 2)^2 = 1$

B.  $9(x - 1)^2 + 16(y - 2)^2 = 144$

C.  $16(x - 1)^2 - 9(y - 2)^2 = 1$

D.  $16(x - 1)^2 + 9(y - 2)^2 = 144$

**Answer: B**



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**46.** 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

A. a pair of straight lines

B. a straight line

C. a circle

D. a parabola

**Answer: C**

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47. If a point P moves such that its distance from the point  $A(1, 1)$  and the line  $x + y + 2 = 0$  are equal then the locus of P is

- A. a straight line
- B. a pair of straight lines
- C. a parabola
- D. an ellipse

**Answer: C**

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48. the equation to the locus of a point which moves so that the sum of its distances from  $(3, 0)$  and  $(-3, 0)$  is less than 9 is

- A.  $20x^2 + 36y^2 < 405$

B.  $2x^2 + 36y^2 > 405$

C.  $36x^2 + 20y^2 < 405$

D.  $36x^2 + 20y^2 > 405$

**Answer: A**



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**49.** If the sum of the distances of a point P from two perpendicular lines in a planes is 1, then the locus of P is a

A. rhombus

B. circle

C. straight line

D. pair of straight lines

**Answer: A**



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50. A straight rod of length 9 unit, slides with its ends A, B always on the x and y axes respectively. Then the locus of the centroid of  $\triangle OAB$  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: B**



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51. 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

A.  $9x^2 + 34y^2 = 2l^2$

B.  $9x^2 - 34y^2 = l^2$

C.  $9x^2 + 36y^2 = 4l^2$

D. None of these

**Answer: C**



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52. If  $A(\cos \alpha, \sin \alpha)$ ,  $B(\sin \alpha - \cos \alpha)$ ,  $C(1, 2)$  are the vertices of a  $\triangle ABC$ , then the locus of its centroid is

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

B.  $3(x^2 + y^2) - 2x - 4y + 1 = 0$

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

D. None

**Answer: B**



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53. Locus of centroid of the triangle whose vertices are  $(a \cos t, a \sin t)$ ,  $(b \sin t - b \cos t)$  and  $(1, 0)$  where  $t$  is a parameter, is

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

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

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

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

**Answer: B**



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## Exercise 2 Special Type Questions Set 1

I : The locus of the point for which the sum of the squares of distances from the coordinate axes is 25 is  $x^2 + y^2 = 25$

II : The locus of the point whose distances to the coordinate axes are in the ratio 2:3 is  $4x^2 - 9y^2 = 0$



A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

**Answer: C**



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

3 : 2, then the locus of P is  $5x^2 + 5y^2 + 78x - 40y + 125 = 0$

II :  $A(-9, 0)$ ,  $B(-1, 0)$  are two points. If P is a point such that

$PA : PB = 3 : 1$ , then the locus of P is  $x^2 + y^2 = 9$

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

**Answer: C**



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

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

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

**Answer: B**



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

A.  $a, b, c$

B.  $c, b, a$

C.  $b, c, a$

D.  $a, c, b$

**Answer: B**



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2. If the locus of the point P such that  $PA^2 + PB^2 = 10$  where  $A(2, 3)$ ,  $B(3, -4)$  is  $x^2 + y^2 + ax + by + c = 0$  then ascending order of  $a, b, c$  is

A.  $a, b, c$

B.  $c, b, a$

C.  $b, c, a$

D.  $a, c, b$

**Answer: A**



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3. If the locus of the point P such that area of  $\triangle PAB$  is 12 sq unit where  $A = (2, 3)$ ,  $B = (-4, 5)$  is  $x^2 + 6xy + 9y^2 + ax + by + c = 0$  then ascending order of  $a, b, c$  is

A.  $a, b, c$

B.  $c, b, a$

C.  $b, c, a$

D.  $a, c, b$

**Answer: C**



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## 1. Match the following

*I.* Locus of a point which is equidistant from two fixed points is

*II.* Locus of a point which is a constant distance from a point is

*III.* The locus of the point whose distance from x-axis is twice that of 1

*IV.*  $A, B$  are two points. If  $PA = k (> AB)$  then locus of P is

A.  $c, d, b, a$

B.  $d, c, a, e$

C.  $d, c, e, a$

D.  $c, d, b, e$

**Answer: A**



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## 2. Match the following

Given condition

- I.* The sum of the squares of distances from P to the coordinate axes is
- II.* The distances to the coordinate axes from P are in the ratio 2 : 3
- III.* The square of whose distance from P to the origin is 4 times of its y
- IV.* The distance from P to (4, 0) is double the distance from P to the x

A.  $a, b, c, d$

B.  $a, e, c, d$

C.  $a, b, d, c$

D.  $b, a, c, e$

**Answer: A**



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## 3. Match the following

- I.* The locus of the point  $(at^2, 2at)$  is *(a)*  $xy =$
- II.* The locus of the point  $(ct, c/t)$  is *(b)*  $y^2 + 4$
- III.* The locus of the point  $(\cos^2 t, 2 \sin t)$  is *(c)*  $x^2 + 4$
- IV.* The locus of the point  $(\cos t + \sin t, \cos t - \sin t)$  is *(d)*  $y^2 =$

A.  $a, c, b, d$

B.  $a, b, c, d$

C.  $a, b, d, c$

D.  $d, a, b, c$

**Answer: D**

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#### Set 4

1. A: The equation to the locus of points which are equidistant from the points  $(-3, 2)$ ,  $(0, 4)$  is  $6x + 4y - 3 = 0$ .

R : The locus of points which are equidistant to  $A, B$  is perpendicular bisector of AB

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

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

C. A is true but R is false

D. A is false but R is true

**Answer: A**



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2. A :  $A(0, 2), B(0, -2)$  and  $PA + PB = 3$  the locus of P is an ellipse

R : Locus of a point, the sum of whose distances from two fixed points always constant ( which is less than distance between the points ) is an ellipse

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

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

C. A is true but R is false

D. A is false , R is false

**Answer: D**



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3. 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 the correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

**Answer: B**

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4. A : If  $A(4, 0)$ ,  $B(-4, 0)$  are two points and  $PA - PB = 4$  then the locus of P is  $3x^2 - y^2 = 12$

R : Let A, B be two points. If  $PA - PB = \text{constant } k (< AB)$  then locus of P is hyperbola

- A. A true , R true and R is correct explanation of A
- B. A true, R true but R is not the correct explanation of A
- C. A is true but R is false
- D. A is false but R is true.

**Answer: A**



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