Level-2, TEST-COORDINATE GEOMETRY

Name: Mob No.

Rough Work

1. Shift the origin to a suitable point so that the equation $y^2+4y+8x-2=0$ will not contain term in y and the constant.

2. A what point the origin be shifted, if the coordinates of a point (-1, 8) become (-7, 3)?

3. If the axes are turned through 45°, find the transformed form of the equation $3x^2+3y^2+2xy=2$.

4. Prove that if the axes be turned through $\frac{\pi}{4}$ the equation $x^2-y^2=a^2$ is transformed to the form $xy=\lambda$. Find the value of λ.

5. Through what angle should the axes be rotated so that the equation $9x^2-2\sqrt{3}xy+7y^2=10$ may be changed to $3x^2+5y^2=5$?

6. If (x,y) and (X,Y) be the coordinates of the same point referred to two sets of rectangular axes with the same origin and if $ux+vy$, when u and v are independent of X and Y become $VX+UY$, show that $u^2+v^2=U^2+V^2$.

7. What does the equation $2x^2+4xy-5y^2+20x-22y-14=0$ becomes when referred to rectangular axes through the point (-2, -3), the new axes being inclined at an angle of 45° with the old?

8. Given the equation, $4x^2+2\sqrt{3}xy+2y^2=1$, through what angle should the axes be rotated so that the term in xy be wanting from the transformed equation.

9. Find λ if (λ, λ+1) is an interior point of ΔABC where, $A\equiv(0,3)$; $B\equiv(-2,0)$ and $C\equiv(6,1)$.

10. If a rod AB of length 2 units slides on coordinate axes in the first quadrant. An equilateral triangle ABC is completed with C on the side away from O. Then, locus of C is:

(a) $x^2+y^2-xy+1=0$; (b) $x^2+y^2-xy\sqrt{3}+1=0$;

(c) $x^2+y^2+xy\sqrt{3}-1=0$; (d) $x^2+y^2-xy\sqrt{3}-1=0$;

11. The sides of a triangle are $3x+4y$, $4x+3y$ and $5x+5y$ units, where $x>0$, $y>0$. The triangle is:

(a) right angled (b) acute angled

(c) obtuse angled (d) isosceles

12. A triangle ABC right angled at A has points A and B as (2,3) and (0,-1) respectively. If BC=5 units, then the point C is:

(a) (4,2) (b) (-4,2) (c) (-4,4) (d) (4,-4)

13. The locus of a point P which divides the line joining (1,0) and (2 cosθ, 2sinθ) internally in the ratio 2:3 for all θ is:

(a) a straight line (b) a circle
(c) a pair of straight lines (d) a parabola

14. The vertices of a triangle are (0, 3), (-3, 0) and (3,0). The coordinates of its orthocentre are:

(a) (0, -2) (b) (0,2) (c) (0,3) (d) (0, -3)

15. ABC is an equilateral triangle such that the vertices B and C lie on two parallel lines at a distance 6. If A lies between the parallel lines at a distance 4 from one of them, then the length of a side of the equilateral triangle is:

(a) 8 (b) $\sqrt{\frac{88}{3}}$ (c) $\frac{4\sqrt{7}}{\sqrt{3}}$ (d) none of these

16. A, B, C are respectively the points (1, 2), (4, 2), (4, 5). If T_1, T_2 are the points of trisection of line segment AC and S_1, S_2 are the points of trisection of the line segment BC, the area of the quadrilateral $T_1S_1S_2T_2$ is:

(a) 1 (b) $\frac{3}{2}$ (c) 2 (d) $\frac{5}{2}$