assign2

AI24BTECH11018 - Sreya

1. The points $(-a, -b)$, $(0, 0)$, (a, b) and $\left(a^2, ab\right)$ (1979)
   a) Collinear
   b) Vertices of a parallelogram
   c) Vertices of a rectangle
   d) None of these
2. The point $(4, 1)$ undergoes the following three transformations successively. (1980)
   a) Reflection about the line $y = x$.
   b) Translation through a distance 2 units along the positive direction of x-axis.
   c) Rotation through an angle $\frac{\pi}{4}$ about the origin in the counter clockwise direction.

   Then the final position of the point is given by the coordinates.
   a) $\left(\frac{1}{\sqrt{2}}, \frac{7}{\sqrt{2}}\right)$
   b) $\left(-\sqrt{2}, 7\sqrt{2}\right)$
   c) $\left(\sqrt{2}, 7\sqrt{2}\right)$
   d) $\left(-\frac{1}{\sqrt{2}}, \frac{7}{\sqrt{2}}\right)$
3. The straigth lines $x + y = 0$,$3x + y - 4 = 0$,$x + 3y - 4 = 0$ form a triangle which is $(1983 - 1Mark)$
   a) isosceles
   b) equilateral
   c) right angled
   d) none of these
4. if P=$(1, 0)$, Q=$(-1, 0)$ and R=$(2, 0)$ are three given points, then the locus of point S satisfing the relation
   $SQ^2 + SR^2 = 2SP^2$, is $(1988 - 2Marks)$
   a) a straigth parallel to x-axis
   b) a circle passing through the origin
   c) a circle with the center at the origin
   d) a starigth line parallel to y-axis
5 Line L has intercepts a and b on the coordinate axes.When the axes are rotated through a given angle,keeping the origin fixed,line L has intercepts p and q then $(1990 - 5Marks)$
   a) $a^2 + b^2 = p^2 + q^2$
   b) $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{p^2} + \frac{1}{q^2}$
   c) $a^2 + p^2 = b^2 + q^2$
   d) $\frac{1}{a^2} + \frac{1}{p^2} = \frac{1}{b^2} + \frac{1}{q^2}$
6. If the sum of distances of a point from two perpendicular lines in a plane is 1,then its locus is $(1992 - 2Marks)$
   a) square
   b) straigth line
   c) circle
   d) two intersecting lines
7. The locus of a variable point whose distance from $(-2, 0)$ is $\frac{2}{3}$ times its distance from the line $x = -\frac{9}{2}$ is (1994)

a) ellipse
b) hyperbola
c) parabola
d) none of these

8. The equations to a pair of opposite sides of parallogrqam are $x^2 - 5x + 6 = 0$ and $y^2 - 6y + 5 = 0$, the equations to its diagnaols are (1994)
   a) $x + 4y = 13, y = 4x - 7$
   b) $4x + y = 13, y = 4x - 7$
   c) $4x + y = 13, 4y = x - 7$
   d) $y - 4x = 13, y + 4x = 7$
9. The orthocenter of the triangle formed by the lines $xy = 0$ and $x + y = 1$ is (1995S)
   a) $\left(\frac{1}{2}, \frac{1}{2}\right)$
   b) $\left(\frac{1}{3}, \frac{1}{3}\right)$
   c) $(0, 0)$
   d) $\left(\frac{1}{4}, \frac{1}{4}\right)$
10. Let PQR be a right angled triangle, right at P(2, 1). If the equation of the line QR is $2x + y = 3$.then the equation representing the pair of lines PQ and PR is $(1990 - 2Marks)$
    a) $3x^2 - 3y^2 + 8xy + 20x + 10y + 25 = 0$
    b) $3x^2 - 3y^2 + 8xy - 20x - 10y + 25 = 0$
    c) $3x^2 - 3y^2 + 8xy + 10x + 15y + 20 = 0$
    d) $3x^2 - 3y^2 - 8xy - 10x - 15y - 20 = 0$
11. If x_1,x_2,x_3 as well as y_1,y_2,y_3, are in G.P with the same common ratio then the points $(x_1$,$y_1)$,$(x_2$,$y_2)$ and $(x_3$,$y_3)$. $(1999 - 2Marks)$
    a) lie on a straight line
    b) lie on ellipse
    c) lie on circle
    d) are vertices of a triangle
12. Let PS be the median of the triangle with vertices P(2, 2), Q(6, −1) and R(7, 3).The equation of the line passing through (1, −1) and parallel to PS is (2000S)
    a) $2x - 9y - 7 = 0$
    b) $2x - 9y - 11 = 0$
    c) $2x + 9y - 11 = 0$
    d) $2x + 9y + 7 = 0$
13. The incentre of the triangle with vertices $\left(1, \sqrt{3}\right)$,$(0, 0)$ and $(2, 0)$ is (2000S)
    a) $\left(1, \frac{\sqrt{3}}{2}\right)$
    b) $\left(\frac{2}{3}, \frac{1}{\sqrt{3}}\right)$
    c) $\left(\frac{2}{3}, \frac{\sqrt{3}}{2}\right)$
    d) $\left(1, \frac{1}{\sqrt{3}}\right)$
14. the number of integer values of m,for which the x-coordinate of the point of intersection of the lines $3x + 4y = 9$ and $y = mx + 1$ is also an integer, is (2001S)
    a) 2
    b) 0
    c) 4
    d) 1
15. Area of the parallelogram formed by the lines $y = mx$,$y = mx + 1$,$y = nx$ and $y = nx + 1$ equals (2001S)

a) $\frac{|m+n|}{(m-n)^2}$
b) $\frac{2}{|m+n|}$
c) $\frac{1}{|m+n|}$
d) $\frac{1}{|m-n|}$

16. Let $0<\alpha<\frac{\pi}{2}$ be fixed angle.if
P=$(\cos\theta, \sin\theta)$ and Q=$(\cos(\alpha-\theta), \sin(\alpha-\theta))$,then Q is obtained from P by (2002S)
a) clockwise rotation around origin through an angle α
b) anticlockwise rotation around the orgin through an angle α
c) reflection in the line through origin with the slope $\tan\alpha$
d) reflection in the line through origin with slope $\tan\left(\frac{\alpha}{2}\right)$

17. Let P=$(-1,0)$,Q=$(0,0)$ and R=$\left(3, \sqrt{3}\right)$ be three points. Then the equation of the bisector of the angle PQR is (2002S)
a) $\frac{\sqrt{3}}{2}x + y = 0$
b) $x + \sqrt{3}y = 0$
c) $\sqrt{3} + y = 0$
d) $x + \frac{\sqrt{3}}{2}y = 0$

18. A straigth line through the origin O meets the parallel lines $4x + 2y = 9$ and $2x + y + 6 = 0$ at points Pand Q respectively. Then the point O divides the segment PQ in the ratio (2002S)
a) 1 : 2
b) 3 : 4
c) 2 : 1
d) 4 : 3