LATEX ASSIGNMENT

ANAND

29-08-2023

EXERCISE 11.10.4

1. Find the values of K for which the line $(K-3), x-(4-k^2)y+k^2-7k+6=0$ is
    (a) Parallel to the x axis.
    (b) Parallel to the y axis.
    (c) Passing through the origin.

2. Find the values of θ and p, if the equation $x\cos\theta+y\sin\theta=P$ is the normal form of the line $\sqrt{3}x+y+2=0$.

3. Find the equations of the lines, which cut-off intercepts on the axes whose sum and product are 1 and -6, respectively.

4. What are the points on the y axis whose distance from the line $\frac{x}{3}+\frac{y}{4}=1$ is 4 units.

5. Find perpendicular distance from the origin to the line joining the points $(\cos\theta\sin\theta)$ and $(\cos\phi, \sin\phi)$.

6. Find the equation of the line parallel to y axis and drawn through the point of intersection of the lines $x-7y+5=0$ and $3x+y=0$.

7. Find equation of a line drawn perpendicular to the line $\frac{x}{4}+\frac{y}{6}=1$ through the point, where it meets the y axis.

8. Find the area of the triangle formed by the lines $y-x=0, x+y=0$ and $x-k=0$.

9. Find the value of p so that the three lines $3x+y-2=0, Px+2y-3=0$ and $2x-y-3=0, px+2y-3=0$ and $2x-y-3=0$ may intersect at one point.

10. If three lines when equation are $y=m_1x+c_1 y=m_2x+c_2$ and $y=m_1x+c_1$ are concurrent, then show that $m_1(c_2-c_3)+m_2(c_1-c_2)=0$

11. Find the equation of the lines through the point (3,2) which make an angle of 45° with the line $x-2y=3$

12. Find the equation of the line passing through the point of intersection of the lines $4x + 7y - 3 = 0$ and $2x - 3y + 1 = 0$ that has equal interceptson the axes.

13. Show that the equation of the line passing through the origin and making an angle θ with the line $y = mx + c$ is $\frac{y}{x} = \frac{m \pm \tan}{1 \mp \tan}$

14. In What ratio, the line joining $(-1, 1)$ and $(5, 7)$ is divided by the line $x + y = 4$?

15. Find the distance of the line $4x = 7y + 5 = 0$ from the point $(1, 2)$ along the line $2x - y = 0$.

16. Find the direction in which a straight line must be drawn through the point $(-1, 2)$ so that the point of intersection with the line $x + y = 4$ may be at a distance of 3 units from this point.

17. The hypothesis of a right angled triangle has its ends at the points $(1, 3)$ and $(-4, 1)$. Find an equation of the legs (perpendicular sides of the triangle.

18. Find the image of the point $(3, 8)$ with respect to the line $x + 3y = 7$ assuming the line to be a plane mirror.

19. If the lines $y = 3x + 1$ and $2y = x + 3$ are equally inclined to the line $y = mx + 4$. Find the value of m.

20. If sum of the perpendicular distance of a variable point $P(x, y)$ from the lines $x + y - 5 = 0$ and $3x - 2y + 7 = 0$ is always 10. Show that P must move on a line.

21. Find equation of the line which is equidistant from parallel lines $9x + 6y = -7$ and $3x + 2y + 6 = 0$.

22. A ray of the light passing through the point $(1, 2)$ reflects on the x axis at point A and the reflected ray passes through the point $(5, 3)$. Find the coordinates of A.

23. Prove that the product of the lengths of the perpendiculars drawn from the points $(\sqrt{a}^2 - b^2, 0)$ and $(\sqrt{a}^2 - b^2, 0)$ to the line $\frac{x}{a} \cos\theta + \frac{y}{b} \sin\theta = lisb^2$

24. A person standing at the junction (crossing) of two straight paths represented by the equations $2x - 3y + 4 = 0$ and $3x + 4y - 5 = 0$ and $3x + 4y - 5 = 0$ wants to reach the path whose equation is $6x - 7y + 8 = 0$ in the least time. Find the equation of the path that he should follow.