Latex Assignment1

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Example:-1-25 (10.7)

1. Find the slope of lines:
   (a) Passing through the points $(3, -2)$ and $(-1, 4)$
   (b) Passing through the points $(3, -2)$ and $(7, -2)$
   (c) passing through the points $(3, -2)$ and $(3, 4)$
   (d) Making inclination of $60°$ with the positive direction of x-axis.
2. If the angle between two lines is $\frac{\pi}{4}$ and slope of one of the lines is $\frac{1}{2}$, find the slope of the other line.
3. Line through the points $(-2, 6)$ and $(4, 8)$ is perpendicular to the line through the points $(8, 12)$ and $(x, 24)$. Find the value of x.
4. Three points (h, k), $Q(x_1, y_1)$ and $R(x_2, y_2)$ lie on a line. Show that $(h - x_1)(y_2 - y_1) = (k - y_1)(x_2 - x_1)$.
5. In Fig. 1, time and distance graph of a linear motion is given. Two positions of line and distance are recorded as, when $T = 0, D = 2$ and when $T = 3, D = 8$. Use the concept of slope, find law of motion i.e, how distance depends upon time.
6. Find the equations of the lines parallel to axes and passing through $(2, 3)$.
7. Find the equation of the line through $(-2, 3)$ with slope -4
8. Write the equation of the line through the points $(1, -1)$ and $(3, 5)$.
9. Write the equation of the lines for which $\tan\theta = \frac{1}{2}$, where θ is the inclination of the line and
   (i) y-intercepts is $\frac{-3}{2}$
   (ii) x-intercept is 4.
10. Find the equation of the lines which makes intercepts -3 and 2 on the x- and y-axes respectively.

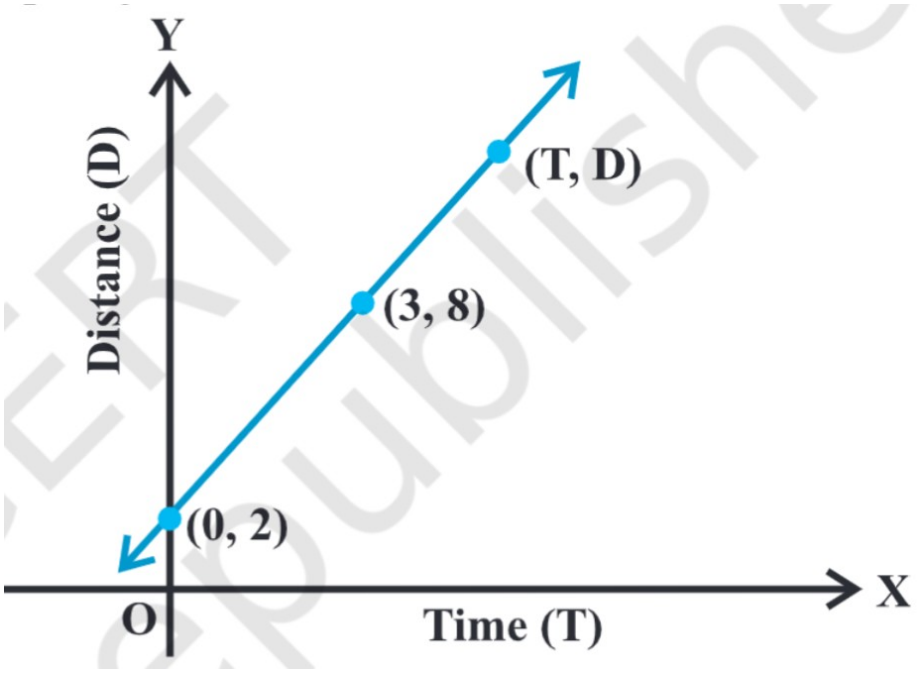

Figure 1: 10.9

11. Find the equation of the line whose perpendicular distance from the origin is 4 units and the angle which the normal makes with positive direction of x-axis is 15°.

12. The Fahrenheit temperature F and absolute temperature K satisfy a linear equation. Given that $K = 273$ when $F = 32$ and that $K = 373$ when $F = 212$. Express K in terms of F and find the value of F, when $K = 0$.

13. Equation of a line is $3x - 4y + 10 = 0$, Find its

    (i) Slope

    (ii) x and y-intercepts.

14. Reduce the equation $\sqrt{3}x + y - 8 = 0$ into normal form.Find the values of p and ω.

15. Find the angle between the lines $y - \sqrt{3}x - 5 = 0$ and $\sqrt{3}y - x + 6 = 0$.

16. Show that two lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ where $b_1b - 2 \neq 0$ are:

    (a) parallel if $\frac{a_1}{b_1} = \frac{a_2}{b_2}$ and

    (b) Perpendicular if $a_1a_2 - b_1b_2 = 0$.

17. Find the equation of a line perpendicular to the line $x + 2y + 3 = 0$ and passing through the point $(1, -2)$.

18. Find the distance of the point $(3, -5)$ from theline $3x - 4y - 26 = 0$.

19. Find the distaance between the parallel lines $3x - 4y + 7 = 0$ and $3x - 4y + 5 = 0$.

20. If the lines $2x + y - 3 = 0, 5x + ky - 3 = 0$ and $3x - y - 2 = 0$ are concurrent, find the value of k.

21. Find the distance of the line $4x - y - 0$ from the point $p(4, 1)$ measured along the line making an angle of $135°$ with the positive x-axis.

22. Assuming that straight lines work as the plane mirror for a point, find the image of the point $(1, 2)$ in the line $x - 3y + 4 = 0$.

23. Show that the area of the triangle formed by the lines $y = m_1x + c_1, y = m_2x + c_2$ and $x = 0$ is $\frac{c_1 - c_2^2}{2|m_1 - m_2|}$

24. A line is such that its segment between the lines $5x - y + 4 = 0$ and $3x + 4y - 4 = 0$ is bisected at the point $(1, 5)$. Obtain its equation.

25. Show that the path of a moving point such that its distances from two lines $3x - 2y = 5$ and $3x + 2y = 5$ are equal is a straight line.