

L^AT_EX 11.10.1.7

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CLASS 11, EXERCISE 10.1

Q7. Find the slope of the line, which makes an angle of 30° with the positive direction of y-axis measured anticlockwise.

Solution: Direction vector of y-axis is $\mathbf{e}_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$ and

direction vector of line is $\mathbf{m} = \begin{pmatrix} 1 \\ m \end{pmatrix}$.

$$\cos(30^\circ) = \frac{\mathbf{m}^T \mathbf{y}}{|\mathbf{m}| |\mathbf{y}|} = \frac{m}{\sqrt{1+m^2}} \quad (1)$$

$$\frac{m}{\sqrt{1+m^2}} = \frac{\sqrt{3}}{2} \quad (2)$$

$$m = \pm \sqrt{3} \quad (3)$$

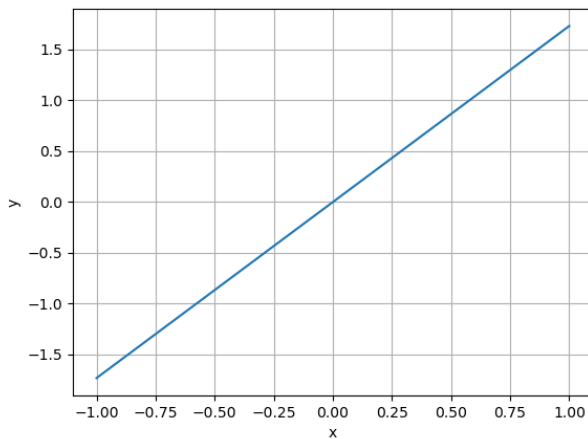


Fig. 1: Line with slope $m = \sqrt{3}$