Matgeo - 1-1.2-19

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Question: Find the slope of lines

1) Passing through the points $(3, -2)$ and $(-1, 4)$
2) Passing through the points $(3, -2)$ and $(7, -2)$
3) Passing through the points $(3, -2)$ and $(3, 4)$
4) Making inclination of $60°$ with the positive direction of x-axis.

Solution:

1)

$$m = B - A = \begin{pmatrix} 3 \\ -2 \end{pmatrix} - \begin{pmatrix} -1 \\ 4 \end{pmatrix}$$
$$= \begin{pmatrix} 4 \\ -6 \end{pmatrix}$$
$$= 4 \begin{pmatrix} 1 \\ \frac{-3}{2} \end{pmatrix}$$

$\therefore$ slope is $\frac{3}{2}$

2)

$$m = B - A = \begin{pmatrix} 3 \\ -2 \end{pmatrix} - \begin{pmatrix} 7 \\ -2 \end{pmatrix}$$
$$= \begin{pmatrix} -4 \\ 0 \end{pmatrix}$$
$$= -4 \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$\therefore$ slope is 0

3)

$$m = B - A = \begin{pmatrix} 3 \\ -2 \end{pmatrix} - \begin{pmatrix} 3 \\ 4 \end{pmatrix}$$
$$= \begin{pmatrix} 0 \\ -6 \end{pmatrix}$$
$$= 6 \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

$\therefore$ slope is $-\infty$

4)

$$m = \begin{pmatrix} \cos \alpha \\ \sin \alpha \end{pmatrix}$$
$$= \begin{pmatrix} \cos 60° \\ \sin 60° \end{pmatrix}$$
$$= \begin{pmatrix} \frac{1}{2} \\ \frac{\sqrt{3}}{2} \end{pmatrix}$$
$$= \frac{1}{2} \begin{pmatrix} 1 \\ \sqrt{3} \end{pmatrix}$$

$\therefore$ slope is $\sqrt{3}$