Assignment 4

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Download all python codes from

https://github.com/ka−raja−babu/Matrix−Theory/tree/main/Assignment4/Codes

and latex-tikz codes from

https://github.com/ka−raja−babu/Matrix−Theory/tree/main/Assignment4

1 Question No. 2.5

If the point $\begin{pmatrix}3\\4\end{pmatrix}$ lies on the graph of the equation $3y = ax + 7$, find the value of a .

2 Solution

The given equation is:-

$$3y = ax + 7 \tag{2.0.1}$$
$$\implies 3y - ax = 7 \tag{2.0.2}$$
$$\implies -ax + 3y = 7 \tag{2.0.3}$$
$$\implies \begin{pmatrix}-a & 3\end{pmatrix}\mathbf{x} = 7 \tag{2.0.4}$$

$\because$ Point $\begin{pmatrix}3\\4\end{pmatrix}$ lies on the graph of this equation and satisfies it.

$\therefore$

$$\begin{pmatrix}-a & 3\end{pmatrix}\begin{pmatrix}3\\4\end{pmatrix} = 7 \tag{2.0.5}$$
$$\implies -3a + 12 = 7 \tag{2.0.6}$$
$$\implies -3a = -5 \tag{2.0.7}$$
$$\implies a = \frac{5}{3} \tag{2.0.8}$$
$$\implies a = 1.67 \tag{2.0.9}$$

Hence,the equation can be written as :-

$$3y = \frac{5}{3}x + 7 \tag{2.0.10}$$
$$\implies \begin{pmatrix}\frac{-5}{3} & 3\end{pmatrix}\mathbf{x} = 7 \tag{2.0.11}$$
$$\implies \begin{pmatrix}-1.67 & 3\end{pmatrix}\mathbf{x} = 7 \tag{2.0.12}$$

Fig. 2.1 is plotted using intercepts as given in table 2.1 .

	Symbols	x	y
x-intercept	**A**	$\frac{-21}{5}$ = -4.2	0
y-intercept	**B**	0	$\frac{7}{3}$ = 2.33

TABLE 2.1: Intercepts

Plot of the given equation:-

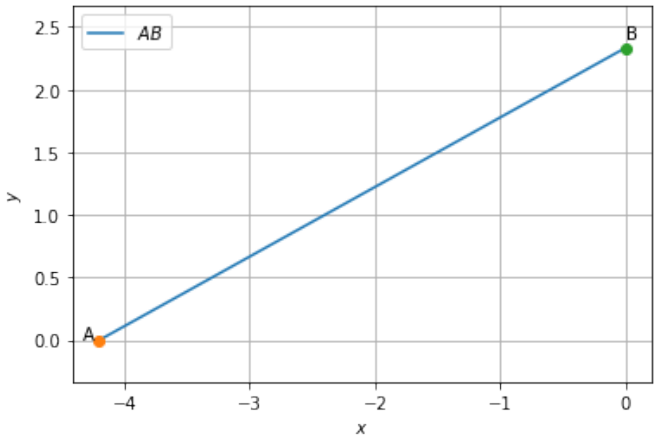

Fig. 2.1: Line AB