4.3.39

EE25BTECH11049 - Sai Krishna Bakki

Question:
If the point (3, 4) lies on the line 3y = ax + 7, find the value of a.
Solution:
Given

$$\mathbf{P} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}, \mathbf{x} = \begin{pmatrix} x \\ y \end{pmatrix} \tag{0.1}$$

$$\begin{pmatrix} a & -3 \end{pmatrix} \mathbf{x} = -7 \tag{0.2}$$

Since point (3,4) lies on the line, substitute (0.1) in (0.2),we get

$$\begin{pmatrix} a & -3 \end{pmatrix} \mathbf{P} = -7 \tag{0.3}$$

$$\begin{pmatrix} a & -3 \end{pmatrix} \begin{pmatrix} 3 \\ 4 \end{pmatrix} = -7 \tag{0.4}$$

$$3a - 12 = -7 \implies a = \frac{5}{3} \tag{0.5}$$

$\therefore$ The value of a is $\frac{5}{3}$.

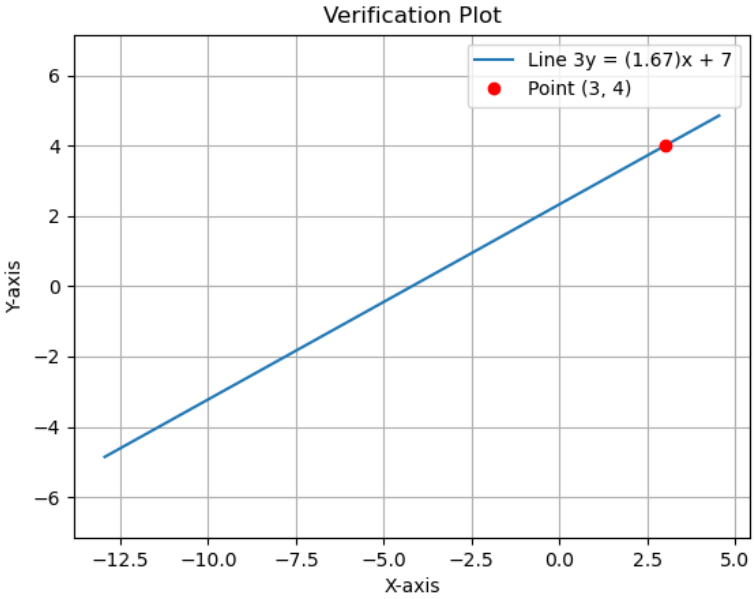
Verification Plot
Line 3y = (1.67)x + 7
Point (3, 4)
Y-axis
X-axis
6
4
2
0
−2
−4
−6
−12.5
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0

Fig. 0.1