ASSIGNMENT 2

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Download all python codes from

https://github.com/Y.Nagarani/ASSIGNMENT2/tree/main/CODES

and latex-tikz codes from

https://github.com/Y.Nagarani/ASSIGNMENT2/tree/main

1 Question No 2.15

Find the equation of the line passing through $\begin{pmatrix}-3\\5\end{pmatrix}$ and perpendicular to the line through the points $\begin{pmatrix}2\\5\end{pmatrix}$ and $\begin{pmatrix}-3\\6\end{pmatrix}$

2 SOLUTION

Let AB be the line passing through $\begin{pmatrix}-3\\5\end{pmatrix}$ and perpendicular to the line CD through $\begin{pmatrix}-2\\5\end{pmatrix}$ and $\begin{pmatrix}-3\\6\end{pmatrix}$

$$\text{Let slope of AB} = (m_1), \text{Let slope of CD} = (m_2), \tag{2.0.1}$$

Now,Line AB is perpendicular to line CD If two lines are perpendicular then product of their slopes are equal to -1

$$\tag{2.0.2}$$

$$\text{slope of AB} \times \text{Slope of CD} = -1 \tag{2.0.3}$$

$$so, (m_1.m_2) = -1 \tag{2.0.4}$$

$$\tag{2.0.5}$$

So, slope of line AB passing through $\begin{pmatrix}2\\5\end{pmatrix}$ and $\begin{pmatrix}-3\\6\end{pmatrix}$

$$\tag{2.0.6}$$

$$(m_2) = \frac{6-5}{-3-2} \tag{2.0.7}$$

$$(m_2) = \frac{-1}{5} \tag{2.0.8}$$

$$Therefore, (m_1) = 5 \tag{2.0.9}$$

$$\tag{2.0.10}$$

$$\text{Therefore,slope of line AB} = (m_1) = 5 \tag{2.0.11}$$

$$\mathbf{P} = \begin{pmatrix}-3\\5\end{pmatrix} and having slope 5 \tag{2.0.12}$$

$$(y-5) = (m_1)(x+3) \tag{2.0.13}$$

$$(y-5) = 5(x+3) \tag{2.0.14}$$

$$5x - y + 20 = 20 \tag{2.0.15}$$

Hence, the required line equation is 5x-y+20 = 0

$$\tag{2.0.16}$$

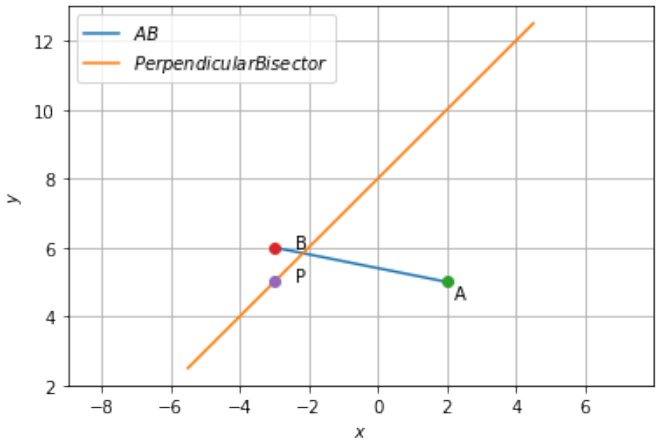

Fig. 0: Perpendicular Bisector