

Assignment4

Teja Vardhan Shannu

QUESTION

Given the vertices of a triangle PQR as $P(2, 2)$, $Q(-4, -4)$, and $R(5, -8)$, find the length of the median through R .

SOLUTION

Input	Output
P	(2,2)
Q	(-4,-4)
R	(5,-8)
M	Midpoint of P,Q

$$\mathbf{P} = \begin{pmatrix} 2 \\ 2 \end{pmatrix}, \quad \mathbf{Q} = \begin{pmatrix} -4 \\ -4 \end{pmatrix}, \quad \mathbf{R} = \begin{pmatrix} 5 \\ -8 \end{pmatrix} \quad (0.1)$$

The midpoint M of the line segment PQ is calculated as:

$$\mathbf{M} = \frac{\mathbf{P} + \mathbf{Q}}{2} \quad (0.2)$$

$$\mathbf{R} = \begin{pmatrix} 5 \\ -8 \end{pmatrix}, \quad \mathbf{M} = \begin{pmatrix} -1 \\ -1 \end{pmatrix} \quad (0.3)$$

$$\mathbf{RM} = \mathbf{R} - \mathbf{M} = \begin{pmatrix} 5 \\ -8 \end{pmatrix} - \begin{pmatrix} -1 \\ -1 \end{pmatrix} = \begin{pmatrix} 5 - (-1) \\ -8 - (-1) \end{pmatrix} = \begin{pmatrix} 6 \\ -7 \end{pmatrix} \quad (0.4)$$

$$|\mathbf{RM}| = \sqrt{6^2 + (-7)^2} = \sqrt{36 + 49} = \sqrt{85} \quad (0.5)$$

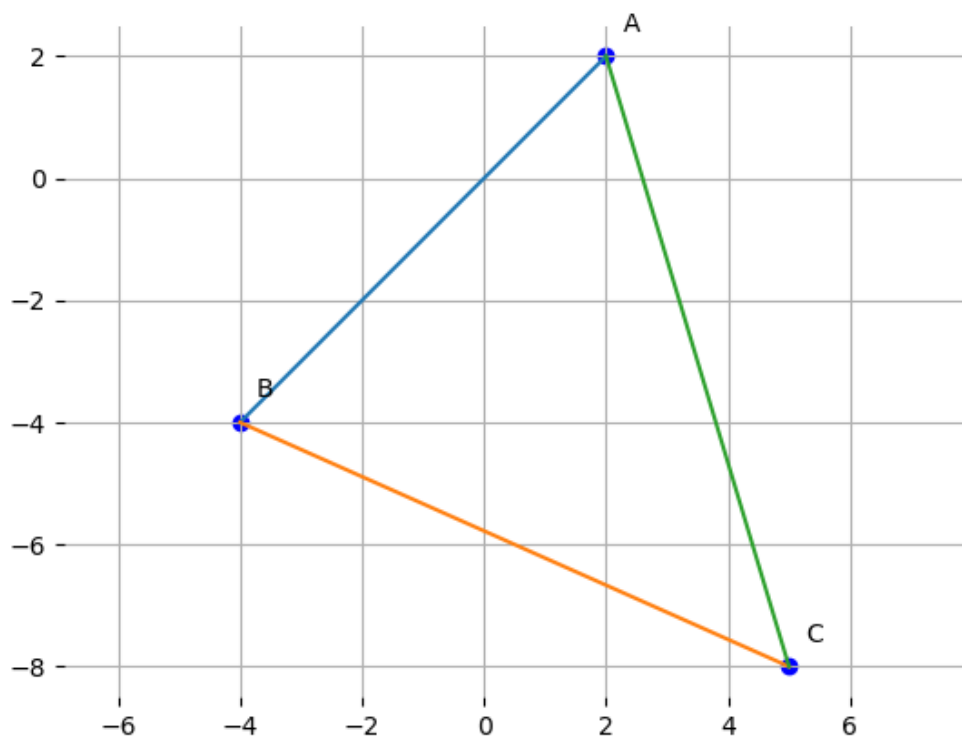


Fig. 0.1: The plot of the points