

2.6.21 Matgeo

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Question

Find the area of the triangle whose vertices are A $(3, 8)$, B $(-4, 2)$ and C $(5, 1)$.

Solution

The area of a triangle ABC is given by :

$$\frac{1}{2} \|(\mathbf{A}-\mathbf{B}) \times (\mathbf{A}-\mathbf{C})\|$$

$$\mathbf{A} - \mathbf{B} = \begin{bmatrix} 3 \\ 8 \end{bmatrix} - \begin{bmatrix} -4 \\ 2 \end{bmatrix} = \begin{bmatrix} 7 \\ 6 \end{bmatrix} \quad (1)$$

$$\mathbf{A} - \mathbf{C} = \begin{bmatrix} 3 \\ 8 \end{bmatrix} - \begin{bmatrix} 5 \\ 1 \end{bmatrix} = \begin{bmatrix} -2 \\ 7 \end{bmatrix} \quad (2)$$

$$\frac{1}{2} \|(\mathbf{A}-\mathbf{B}) \times (\mathbf{A}-\mathbf{C})\| = 14 \quad (3)$$

The area of the triangle ABC is 14

Graphical Representation

