Assignment 5

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Find Python Codes from below link

https://github.com/Nagarajunaddi/Assignment−5

and latex-tikz codes from

https://github.com/Nagarajunaddi/Assignment−5

1 Examples II

1.1 Question

Find the area of the triangle, the coordinates of whose angular points are (0,4),(3,6) and (-8,-2).

1.2 Solution

Given vertices in vector form

$$\mathbf{A} = \begin{pmatrix} 0 \\ 4 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 3 \\ 6 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} -8 \\ -2 \end{pmatrix} \tag{1.2.1}$$

$$\text{Area of Triangle} = \frac{1}{2} \times \left| (\mathbf{A} - \mathbf{C}) \ (\mathbf{A} - \mathbf{B}) \right| \tag{1.2.2}$$

$$(\mathbf{A} - \mathbf{C}) = \begin{pmatrix} 0 \\ 4 \end{pmatrix} - \begin{pmatrix} -8 \\ -2 \end{pmatrix} = \begin{pmatrix} 8 \\ 6 \end{pmatrix} \tag{1.2.3}$$

$$(\mathbf{A} - \mathbf{B}) = \begin{pmatrix} 0 \\ 4 \end{pmatrix} - \begin{pmatrix} 3 \\ 6 \end{pmatrix} = \begin{pmatrix} -3 \\ -2 \end{pmatrix} \tag{1.2.4}$$

$$\text{Area of Triangle} = \frac{1}{2} \times \left| (\mathbf{A} - \mathbf{C}) \ (\mathbf{A} - \mathbf{B}) \right| \tag{1.2.5}$$

$$= \frac{1}{2} \times \begin{vmatrix} 8 & -3 \\ 6 & -2 \end{vmatrix} \tag{1.2.6}$$

$$= \frac{1}{2} \times (-16 + 18) \tag{1.2.7}$$

$$= 1 \tag{1.2.8}$$

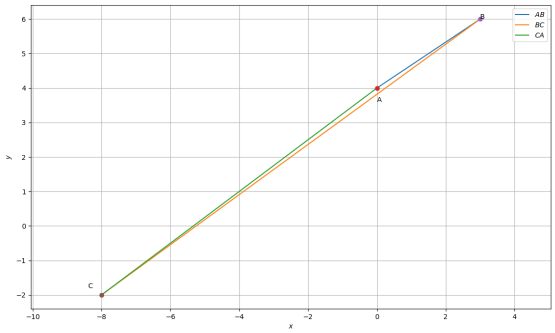

Fig. 0: Triangle