Assignment 3

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Download all python codes from

https://github.com/AnilMondedla/Python/Assignment_3

and latex-tikz codes from

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1 Problem

2.5. Check whether

$$\begin{pmatrix}5\\-2\end{pmatrix},\begin{pmatrix}6\\4\end{pmatrix},\begin{pmatrix}7\\-2\end{pmatrix}$$

are the vertices of an isosceles triangle.

2 Solution

Given vertices are

$$\mathbf{A}=\begin{pmatrix}5\\-2\end{pmatrix},\mathbf{B}=\begin{pmatrix}6\\4\end{pmatrix},\mathbf{C}=\begin{pmatrix}7\\-2\end{pmatrix} \tag{2.0.1}$$

In an isosceles triangle length of two sides will be equal

$$\text{OA vector} = (5\text{i} - 2\text{j}) \text{ vector} \tag{2.0.2}$$
$$\text{OB vector} = (6\text{i} + 4\text{j}) \text{ vector} \tag{2.0.3}$$
$$\text{OC vector} = (7\text{i} - 2\text{j}) \text{ vector} \tag{2.0.4}$$

$$\text{AB vector} = \text{OB} - \text{OA} \tag{2.0.5}$$
$$= (6i+4j)-(5i-2j) \tag{2.0.6}$$
$$= (i+6j) \text{ vector} \tag{2.0.7}$$
$$|AB| = \sqrt{(1)^2+(6)^2} \tag{2.0.8}$$
$$= \sqrt{37} \tag{2.0.9}$$
$$\text{BC vector} = \text{OC} - \text{OB} \tag{2.0.10}$$
$$= (7i-2j)-(6i+4j) \tag{2.0.11}$$
$$= (i-6j) \text{ vector} \tag{2.0.12}$$
$$|BC| = \sqrt{(1)^2+(-6)^2} \tag{2.0.13}$$
$$= \sqrt{37} \tag{2.0.14}$$
$$\text{CA vector} = \text{OA} - \text{OC} \tag{2.0.15}$$
$$= (5i-2j)-(7i-2j) \tag{2.0.16}$$
$$= (-2i) \text{ vector} \tag{2.0.17}$$
$$|CA| = \sqrt{(-2)^2} \tag{2.0.18}$$
$$= 2 \tag{2.0.19}$$

Sides AB and BC are equal. Hence the given points are the vertices of isosceles triangle.

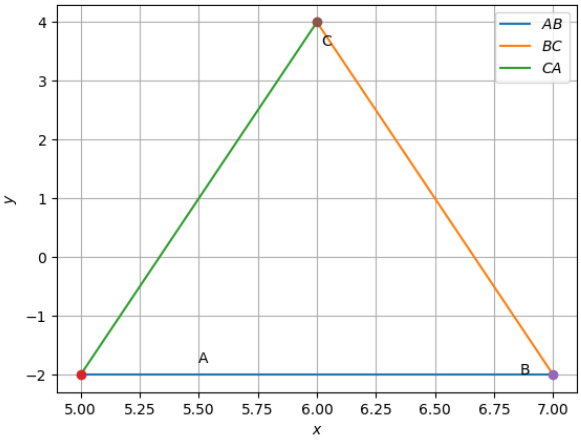

Fig. 0: triangle