Assignment 3

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Download all python codes from

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

and latex-tikz codes from

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

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

The direction vectors of AB,BC and CA are

$$\mathbf{B}-\mathbf{A}=\begin{pmatrix}1\\6\end{pmatrix} \tag{2.0.2}$$

$$\mathbf{C}-\mathbf{B}=\begin{pmatrix}1\\-6\end{pmatrix} \tag{2.0.3}$$

$$\mathbf{A}-\mathbf{C}=\begin{pmatrix}-2\\0\end{pmatrix} \tag{2.0.4}$$

$$|AB|=\sqrt{\left(1\right)^2+\left(6\right)^2} \tag{2.0.5}$$

$$=\sqrt{37} \tag{2.0.6}$$

$$|BC|=\sqrt{\left(1\right)^2+\left(-6\right)^2} \tag{2.0.7}$$

$$=\sqrt{37} \tag{2.0.8}$$

$$|CA|=\sqrt{\left(-2\right)^2} \tag{2.0.9}$$

$$=2 \tag{2.0.10}$$

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

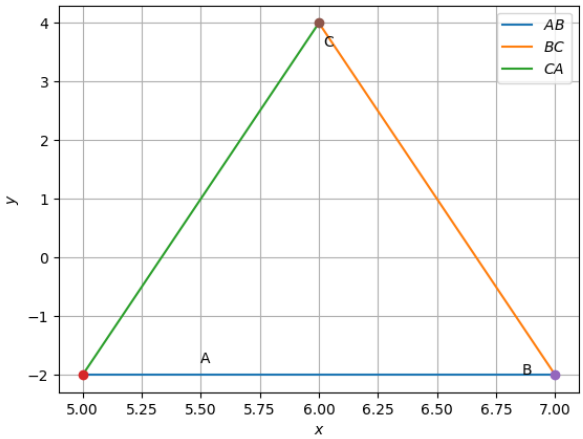

Fig. 0: triangle