

Assignment 1

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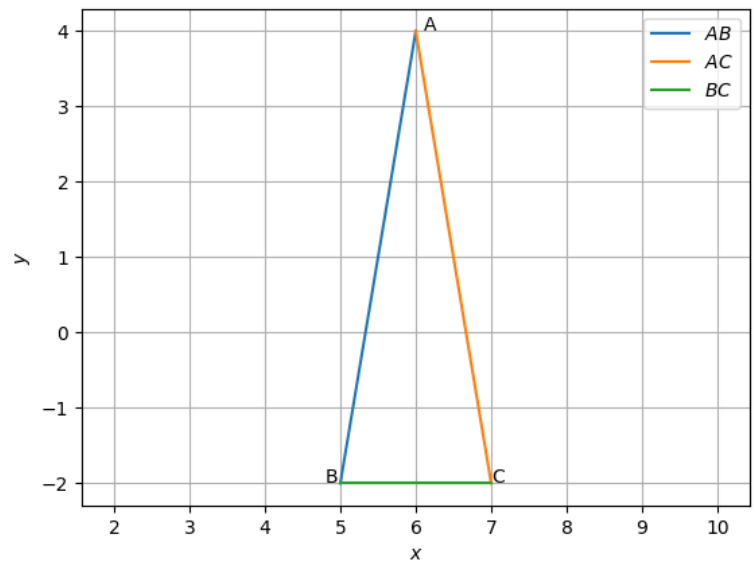
Download all python codes from

https://github.com/cars3/Ex-2.5_Isoceles_triangle/blob/main/Diagram%20for%20Ex-2.5.py

and latex-tikz codes from

https://github.com/cars3/Ex-2.5_Isoceles_triangle/

With this we can understand that the $\triangle ABC$ is an Isosceles triangle The triangle $\triangle ABC$ is shown in Fig0



1 PROBLEM

(vectors 2.5) Are the following points from the vertices of Isosceles triangle?

$$\mathbf{A} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 6 \\ 4 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 7 \\ -2 \end{pmatrix} \quad (1.0.1)$$

2 SOLUTION

With the given points

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

To find out whether the triangle formed is an isosceles triangle the distance formula can be used, the formula is -

For 2 points $M = (x_1, y_1)$ and $N = (x_2, y_2)$

$$\overline{MN} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Now applying this formula on the triangle

$$AB = \sqrt{(6 - 5)^2 + (4 - (-2))^2} = \sqrt{1^2 + 6^2} = \sqrt{35}$$

(not -35, as distance will always be in positive)

$$BC = \sqrt{(7 - 6)^2 + (-2 - 4)^2} = \sqrt{1^2 + (-6)^2} = \sqrt{35}$$

$$AC = \sqrt{(7 - 5)^2 + ((-2) - (-2))^2} = \sqrt{4} = 2$$

After the application of the formula, it can be understood that $\overline{AB} = \overline{BC}$