Assignment 1

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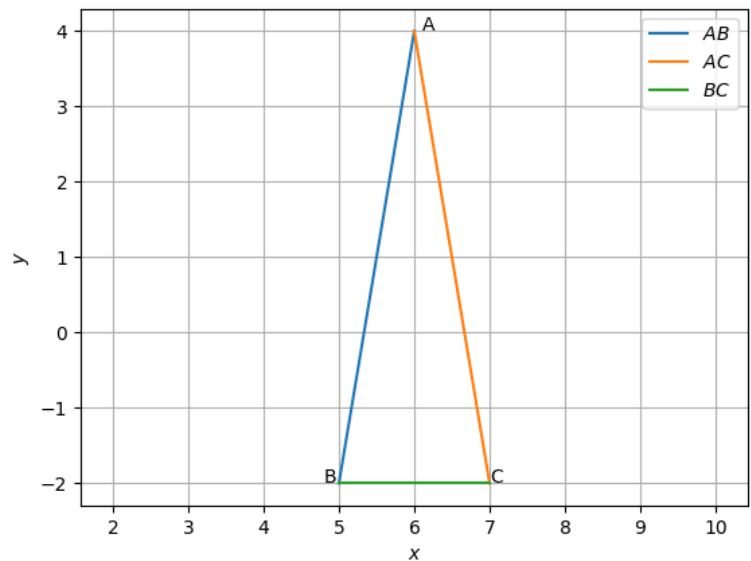
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1 PROBLEM

(vectors 2.5) Are the points form the verices o Isoceles triangle?

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

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 isoceles triangle the distance formula needs to be applied which 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 $\overline{AB} = \overline{BC}$

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