Presentation

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1. Problem

2. Solution
   - Vector Representation
   - Area of triangle

Problem Statement

(1.56) Find area of the triangle with vertices at the point given in each of the following :
(i) (1 0) , (6 0) , (4 3)

Vector Representation

vertices in vector form

$$A = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, B = \begin{pmatrix} 6 \\ 0 \end{pmatrix}, C = \begin{pmatrix} 4 \\ 3 \end{pmatrix} \tag{3.1}$$

Area of trangle

Area of triangle $\triangle ABC$ is given by

$$\frac{1}{2} \times \begin{vmatrix} 1 & 1 & 1 \\ A & B & C \end{vmatrix} \tag{3.2}$$

$$\det(ABC) = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 6 & 4 \\ 0 & 0 & 3 \end{vmatrix} \tag{3.3}$$

$$= 3 \begin{vmatrix} 1 & 1 \\ 1 & 6 \end{vmatrix} \tag{3.4}$$

$$= 3(6-1) \tag{3.5}$$

$$= 3(5) \tag{3.6}$$

$$\det(ABC) = 15 \tag{3.7}$$

Area of trangle

Area of triangle $\triangle ABC$ is given by

$$\frac{1}{2} \times \det(ABC) \tag{3.8}$$

$$\Delta = \frac{1}{2} \times 15 \tag{3.9}$$

$$\Delta = 7.5 \tag{3.10}$$

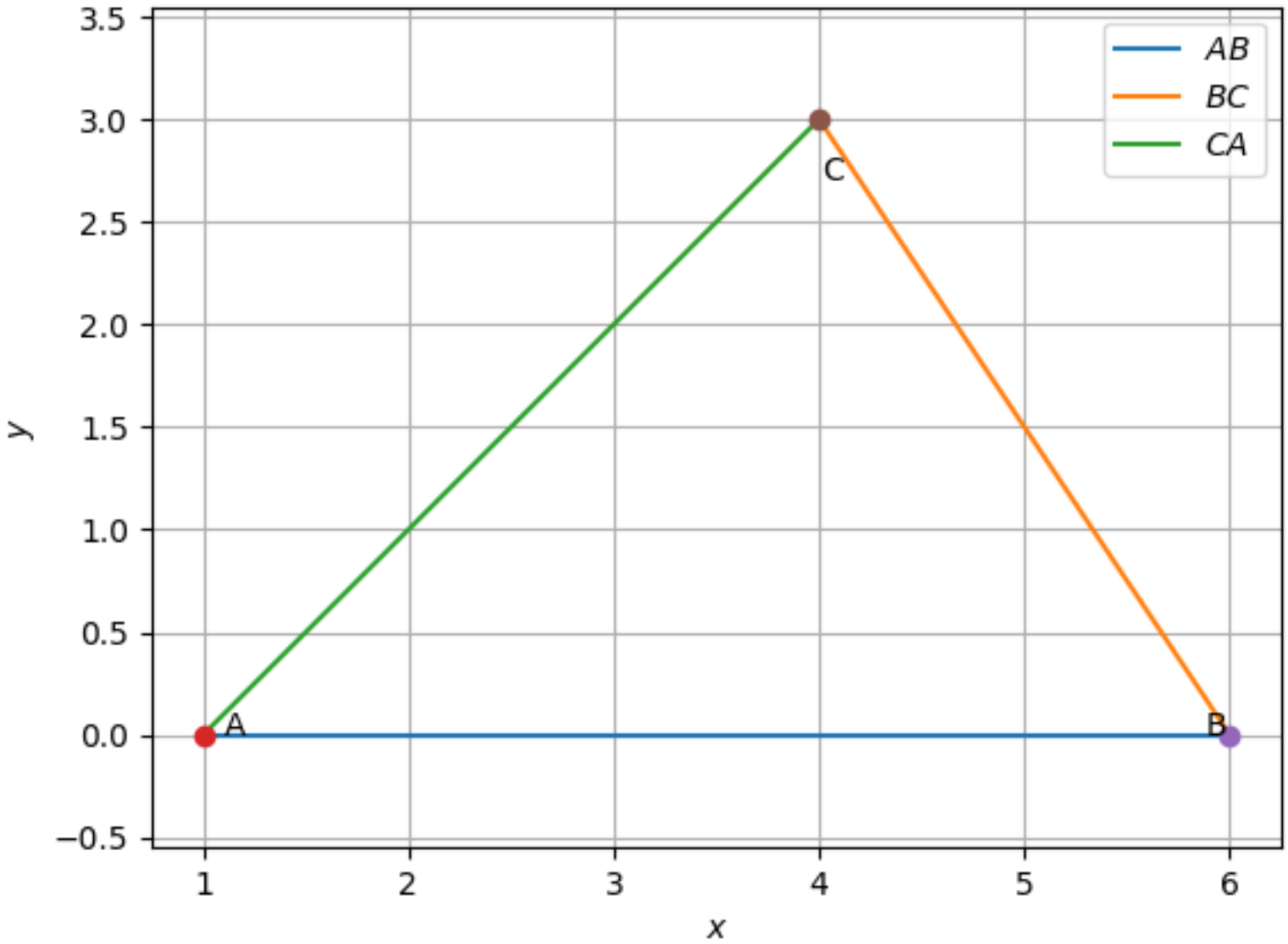

Figure: Triangle