

1.8.12

AI25BTECH11033–SNEHAMRUDULA

1.8.12 The perimeter of a triangle with vertices $(0, 4)$, $(0, 0)$ and $(3, 0)$ is

1) **Given:** Vertices of the triangle are

$$A = \begin{pmatrix} 0 \\ 4 \end{pmatrix}, \quad B = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \quad C = \begin{pmatrix} 3 \\ 0 \end{pmatrix}$$

2) **Lengths of sides:**

$$AB = \|A - B\| = \left\| \begin{pmatrix} 0 \\ 4 \end{pmatrix} - \begin{pmatrix} 0 \\ 0 \end{pmatrix} \right\| = \left\| \begin{pmatrix} 0 \\ 4 \end{pmatrix} \right\| = 4$$

$$BC = \|B - C\| = \left\| \begin{pmatrix} 0 \\ 0 \end{pmatrix} - \begin{pmatrix} 3 \\ 0 \end{pmatrix} \right\| = \left\| \begin{pmatrix} -3 \\ 0 \end{pmatrix} \right\| = 3$$

$$CA = \|C - A\| = \left\| \begin{pmatrix} 3 \\ 0 \end{pmatrix} - \begin{pmatrix} 0 \\ 4 \end{pmatrix} \right\| = \left\| \begin{pmatrix} 3 \\ -4 \end{pmatrix} \right\| = \sqrt{3^2 + (-4)^2} = 5$$

3) **Perimeter:**

$$P = AB + BC + CA = 4 + 3 + 5 = 12$$

4) **Conclusion:** The perimeter of the triangle is

12

3D Representation of Triangle ABC ($z=0$ plane)

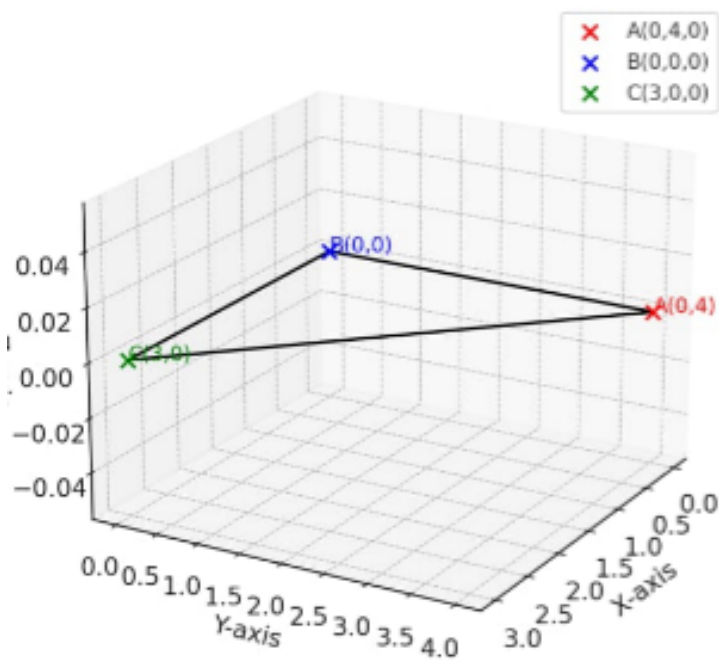


Fig. 4.1