## 1.1.8.17

## EE24BTECH11024 - G.Abhimanyu Koushik

**Question:** 

The perimeter of triangle with vertices  $\begin{pmatrix} 0 \\ 4 \end{pmatrix}$ ,  $\begin{pmatrix} 0 \\ 0 \end{pmatrix}$  and  $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$  is **Solution:** 

Symbol	Value	Description
A	$\begin{pmatrix} 0 \\ 4 \end{pmatrix}$	First vertex
В	$\begin{pmatrix} 3 \\ 0 \end{pmatrix}$	Second vertex
О	$\begin{pmatrix} 0 \\ 0 \end{pmatrix}$	Third vertex

TABLE 0: Variables Used

Distance between A and B,  $d_1$  is

$$\mathbf{A} - \mathbf{B} = \begin{pmatrix} 0 \\ 4 \end{pmatrix} - \begin{pmatrix} 3 \\ 0 \end{pmatrix} = \begin{pmatrix} -3 \\ 4 \end{pmatrix} \tag{0.1}$$

$$(A-B)^{T}(A-B) = 25 (0.2)$$

$$d_1 = \|\mathbf{A} - \mathbf{B}\| = 5 \tag{0.3}$$

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Distance between A and O,  $d_2$  is

$$\mathbf{A} - \mathbf{O} = \begin{pmatrix} 0 \\ 4 \end{pmatrix} - \begin{pmatrix} 0 \\ 0 \end{pmatrix} = \begin{pmatrix} 0 \\ 4 \end{pmatrix} \tag{0.4}$$

$$(A - B)^{T} (A - B) = 16 \tag{0.5}$$

$$d_2 = ||\mathbf{A} - \mathbf{O}|| = 4 \tag{0.6}$$

Distance between O and B,  $d_3$  is

$$\mathbf{O} - \mathbf{B} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} - \begin{pmatrix} 3 \\ 0 \end{pmatrix} = \begin{pmatrix} -3 \\ 0 \end{pmatrix} \tag{0.7}$$

$$(A - B)^{T} (A - B) = 9 (0.8)$$

$$d_3 = \|\mathbf{O} - \mathbf{B}\| = 3 \tag{0.9}$$

Perimeter of the triangle is

$$d_1 + d_2 + d_3 = 12 \tag{0.10}$$

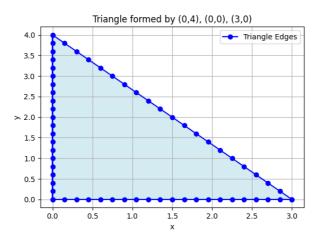


Fig. 0.1: Plot of the triangle