Assignment No.1

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Download all python codes from

https://github.com/Nagarajunaddi/Assignments_CSP

and latex codes from

https://github.com/Nagarajunaddi/Assignments_CSP

1 Question No:1.75(i)

Question : Find values of k if area of triangle is 4sq.units and vertices (k 0) , (4 0), (0 2)

2 Solution

Solution :
vertices in vector form

$$\mathbf{A} = \begin{pmatrix} k \\ 0 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 0 \\ 2 \end{pmatrix} \tag{2.0.1}$$

The Area Matrix is

$$\begin{pmatrix} 1 & 1 & 1 \\ \mathbf{A} & \mathbf{B} & \mathbf{C} \end{pmatrix} \tag{2.0.2}$$

$$\begin{pmatrix} 1 & 1 & 1 \\ k & 4 & 0 \\ 0 & 0 & 2 \end{pmatrix} \tag{2.0.3}$$

Given that Area of triangle is 4

$$Areaof Triangle = \frac{1}{2} \times \left| AreaMatrix \right| \tag{2.0.4}$$

$$\frac{1}{2} \times \begin{vmatrix} 1 & 1 & 1 \\ \mathbf{A} & \mathbf{B} & \mathbf{C} \end{vmatrix} = 4 \tag{2.0.5}$$

$$\frac{1}{2} \times \begin{vmatrix} 1 & 1 & 1 \\ k & 4 & 0 \\ 0 & 0 & 2 \end{vmatrix} = 4 \tag{2.0.6}$$

$$\frac{1}{2} \times (2 \times (4 - k)) = 4 \tag{2.0.7}$$

$$\frac{1}{2} \times (8 - 2k) = 4 \tag{2.0.8}$$

$$8 - 2k = 8 \tag{2.0.9}$$

$$k = 0 \tag{2.0.10}$$

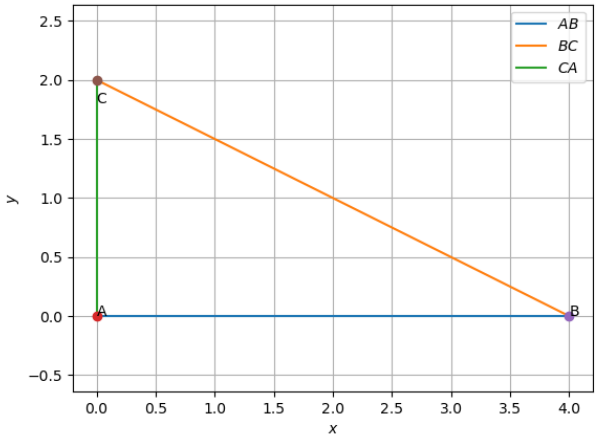

Fig. 0: Triangle