

# Assignment 1

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Download all python codes from

[https://github.com/KeshavRoy/area\\_of\\_triangle](https://github.com/KeshavRoy/area_of_triangle)

and latex-tikz codes from

[https://github.com/KeshavRoy/area\\_of\\_triangle](https://github.com/KeshavRoy/area_of_triangle)

## 1 PROBLEM

(1.56 ) Find area of the triangle with vertices at the point given in each of the following :

(i) (2 7) , (1 1) , (10 8)

## 2 SOLUTION

vertices in vector form

$$\mathbf{A} = \begin{pmatrix} 2 \\ 7 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} 10 \\ 8 \end{pmatrix} \quad (2.0.1)$$

Area of triangle  $\triangle ABC$  is given by

$$\frac{1}{2} \times \begin{vmatrix} 1 & 1 & 1 \\ A & B & C \end{vmatrix} \quad (2.0.2)$$

Area of triangle  $\triangle ABC$  is  $\det(\Delta ABC) =$

$$\frac{1}{2} \times \begin{vmatrix} 1 & 1 & 1 \\ 2 & 1 & 10 \\ 7 & 1 & 8 \end{vmatrix} \quad (2.0.3)$$

$$\Delta = \frac{1}{2} \times \left( 1 \begin{vmatrix} 1 & 10 \\ 1 & 8 \end{vmatrix} - 1 \begin{vmatrix} 2 & 10 \\ 7 & 8 \end{vmatrix} + 1 \begin{vmatrix} 2 & 1 \\ 7 & 1 \end{vmatrix} \right) \quad (2.0.4)$$

$$\Delta = \frac{1}{2} \times (1(8 - 10) - 1(16 - 70) + 1(2 - 7)) \quad (2.0.5)$$

$$\Delta = \frac{1}{2} \times (-2 + 54 - 5) \quad (2.0.6)$$

$$\Delta = \frac{1}{2} \times (47) \quad (2.0.7)$$

$$\Delta = 23.5 \quad (2.0.8)$$

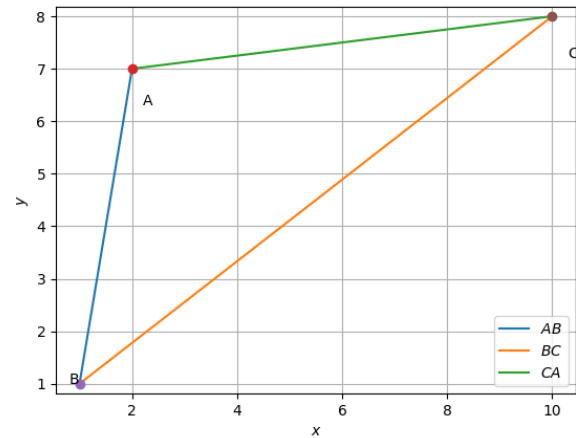


Fig. 0: triangle