

# Assignment 1

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Find Python Codes from below link

<https://github.com/HimaMadhu/INTERNSHIP-IITH-1/blob/main/Assignment3/Assignment3.py>

and latex-tikz codes from

<https://github.com/HimaMadhu/INTERNSHIP-IITH-1/blob/main/Assignment3/Assignment3.tex>

From (1.2.1) area of the triangle is

$$= \frac{1}{2} \begin{vmatrix} 0 & 2a \\ 2c & b \end{vmatrix} \quad (1.2.6)$$

$$= \frac{1}{2} [(0 \times b) - (2a \times 2c)] \quad (1.2.7)$$

$$= \frac{1}{2} (0 - 4ac) \quad (1.2.8)$$

$$= -2ac \quad (1.2.9)$$

Area of the Triangle formed by  $(a, b + c)$ ,  $(a, b - c)$  and  $(-a, c)$  points is  $-2ac$

## 1 EXAMPLES 2

### 1.1 Question 4

Find the areas of the triangle the coordinates of whose angular points are respectively  $(a, b + c)$ ,  $(a, b - c)$  and  $(-a, c)$ .

### 1.2 Solution

Area of a triangle whose vertex point vectors are  $\mathbf{A}$ ,  $\mathbf{B}$  and  $\mathbf{C}$

$$\frac{1}{2} |\mathbf{A} - \mathbf{B} \quad \mathbf{A} - \mathbf{C}| \quad (1.2.1)$$

$$\text{Let } \mathbf{A} = \begin{pmatrix} a \\ b + c \end{pmatrix}, \mathbf{B} = \begin{pmatrix} a \\ b - c \end{pmatrix}, \mathbf{C} = \begin{pmatrix} -a \\ c \end{pmatrix}$$

$$\mathbf{A} - \mathbf{B} = \begin{pmatrix} a \\ b + c \end{pmatrix} - \begin{pmatrix} a \\ b - c \end{pmatrix} \quad (1.2.2)$$

$$= \begin{pmatrix} 0 \\ 2c \end{pmatrix} \quad (1.2.3)$$

$$\mathbf{A} - \mathbf{C} = \begin{pmatrix} a \\ b + c \end{pmatrix} - \begin{pmatrix} -a \\ c \end{pmatrix} \quad (1.2.4)$$

$$= \begin{pmatrix} 2a \\ b \end{pmatrix} \quad (1.2.5)$$