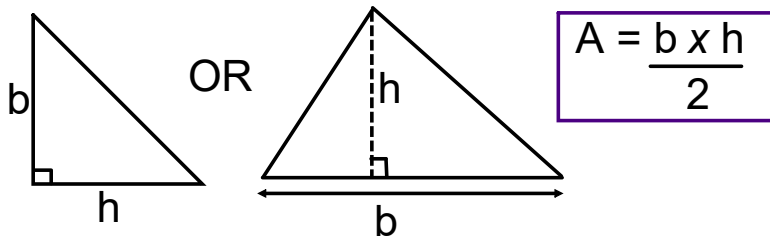


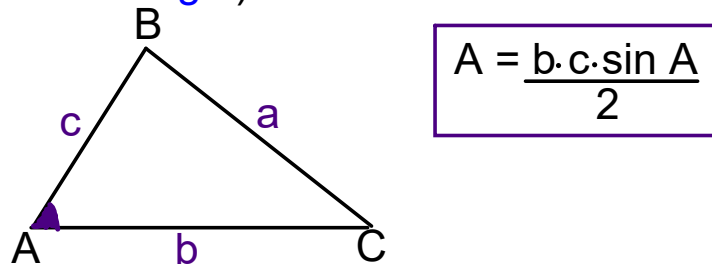
Area of Triangles

1) Right Angled Triangle

2) Area of Non-Right Angled Triangles

1) Sandwich formula

(a.k.a area of a triangle given **2 sides** and the **included angle**)



Examples: Find the area of the following

1)

Diagram of a triangle with two sides labeled 6cm and 10cm, and an included angle of 115° .

$$A = \frac{b \cdot c \cdot \sin A}{2}$$

$$= \frac{6 \cdot 10 \cdot \sin 115^\circ}{2}$$

$$= 27.19 \text{ cm}^2$$

2)

Diagram of a triangle with two sides labeled 15cm and 12cm, and an included angle of 37° . The other two angles are labeled 88° and 55° .

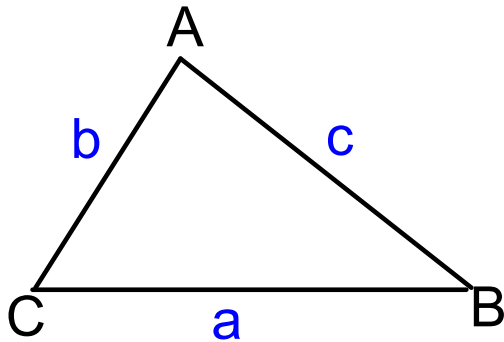
$$\textcircled{1} 180^\circ - 88^\circ - 55^\circ = 37^\circ$$

$$\textcircled{2} A = \frac{15 \cdot 12 \cdot \sin 37^\circ}{2}$$

$$= 54.16 \text{ cm}^2$$

Hero's Formula

Use Hero's Formula when you are trying to find the area of a non-right angled triangle and you are only given 3 sides.



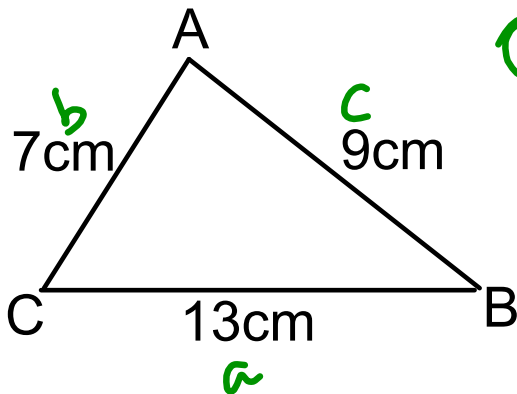
Formula:

$$A = \sqrt{p(p-a)(p-b)(p-c)}$$

Where $p = \frac{a+b+c}{2}$

↓
"semi-perimeter"

Example: Find the area



$$\textcircled{1} p = \frac{13+7+9}{2} = \frac{29}{2} = 14.5$$

$$\begin{aligned} \textcircled{2} A &= \sqrt{14.5(14.5-13)(14.5-7)(14.5-9)} \\ &= \sqrt{14.5(1.5)(7.5)(5.5)} \\ &= \sqrt{897.1875} \\ &= 29.95 \text{ cm}^2 \end{aligned}$$