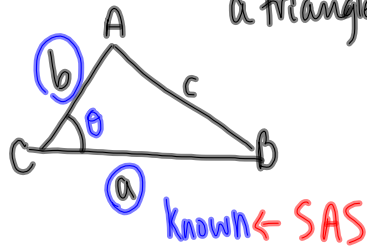
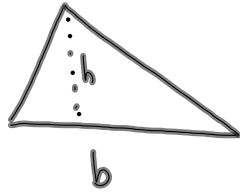


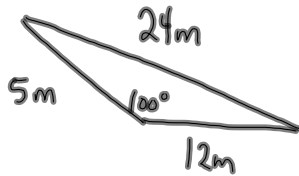
Finding the area of a quadrilateral

Recall: $A = \frac{1}{2}bh$ $A = \frac{1}{2}absinC$

These can be used to find the area of a triangle.



Example

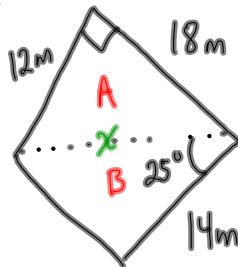


$Area = \frac{1}{2}absinC$

$Area = \frac{1}{2}(5m)(12m)sin100^\circ$

$Area = 29.5m^2$

Example



Triangle A (right Δ)

$Area_A = \frac{1}{2}bh$

$Area_A = \frac{1}{2}(12m)(18m)$

$Area_A = 108m^2$

To find x:

$c^2 = a^2 + b^2$

$c^2 = 12^2 + 18^2$

$c^2 = 468m^2$

$c = 21.6m$

Area of Triangle B:

$Area_B = \frac{1}{2}absinC$

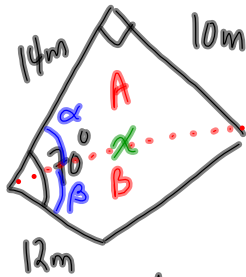
$Area_B = \frac{1}{2}(14m)(21.6m)sin25^\circ$

$Area_B = 64.0m^2$

Total Area = $108m^2 + 64.0m^2$

Total Area = $172m^2$

Example



Find the area of Triangle A (right Δ)

$$\text{Area}_A = \frac{1}{2}bh$$

$$\text{Area}_A = \frac{1}{2}(10m)(14m)$$

$$\text{Area}_A = 70m^2$$

Find x : $c^2 = a^2 + b^2$

$$c^2 = 14^2 + 10^2$$

$$c^2 = 296m^2$$

$$c = 17.2m$$

Find α : $\tan \alpha = \frac{\text{opp}}{\text{adj}}$

$$\tan \alpha = \frac{10m}{14m}$$

$$\alpha = \tan^{-1}\left(\frac{10}{14}\right)$$

$$\alpha = 35.5^\circ$$

Find β :

$$\alpha + \beta = 70^\circ$$

$$35.5^\circ + \beta = 70^\circ$$

$$\beta = 34.5^\circ$$

Find the Area of B:

$$\text{Area}_B = \frac{1}{2}ab \sin C$$

$$\text{Area}_B = \frac{1}{2}(12m)(17.2m) \sin 34.5^\circ$$

$$\text{Area}_B = 58.4m^2$$

$$\text{Total Area} = 70m^2 + 58.4m^2$$

$$\text{Total Area} = 128.4m^2$$