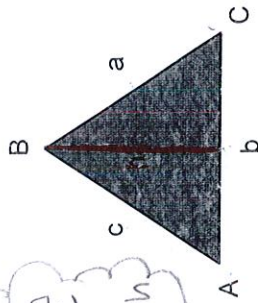


Area of a non-right triangle

Use Trig to find height

$$\sin A = \frac{h}{c}$$

$$c \sin A = h$$



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

$$A = \frac{1}{2}b(c \sin A)$$

$$A = \frac{1}{2}bc \sin A$$

Use with 2 sides and included angle.

$$\text{Area} = \frac{1}{2}bc \sin A$$

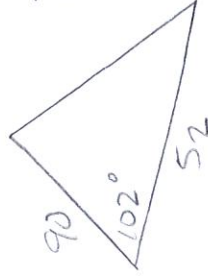
$$\text{Area} = \frac{1}{2}ab \sin C$$

$$\text{Area} = \frac{1}{2}ac \sin B$$

Ex.1: Find the area of a triangle with two sides of lengths 90m and 52m and an included angle of 102° .

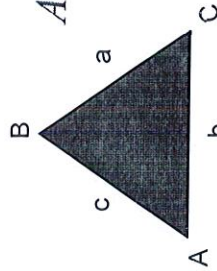
$$A = \frac{1}{2}(90)(52) \sin 102^\circ$$

$$A = 2288.9 \text{ m}^2$$



Area of a Triangle

Heron's Area Formula



$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

$$s = \frac{a+b+c}{2}$$

① Find s (half the triangles perimeter)

② Plug into formula

Ex.2: Find the area of a triangle with side lengths of 43m, 53m and 72m.

$$s = \frac{43 + 53 + 72}{2} \quad s = 84$$

$$A = \sqrt{84(84-43)(84-53)(84-72)}$$

$$A = \sqrt{1281168}$$

$$A = 1131.9 \text{ m}^2$$