Area of Triangles

(1)

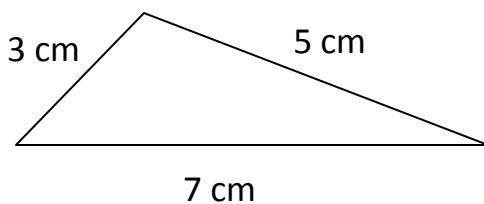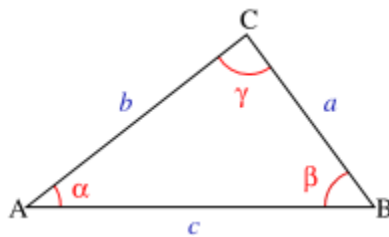**Same old formula...**   Area = $\dfrac{base \times height}{2}$

h

b

h

b
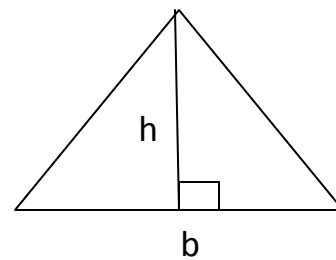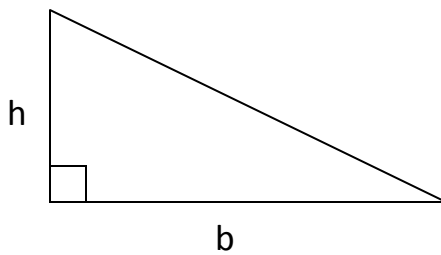
2.

Hero's Formula   p = $\dfrac{(a+b+c)}{2}$ Area = $\sqrt{p(p-a)(p-b)(p-c)}$

- This formula is used when you have all 3 sides of a triangle

Example:

3 cm   5 cm

7 cm

p = $\dfrac{(a+b+c)}{2}$

p = $\dfrac{(5+3+7)}{2}$

p = $\dfrac{(15)}{2}$

p = 7.5

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

Area = $\sqrt{7.5(7.5-5)(7.5-3)(7.5-7)}$

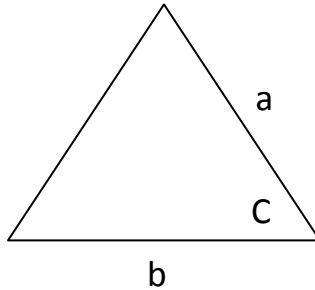Area = $\sqrt{7.5(2.5)(4.5)(0.5)}$

Area = $\sqrt{7.5(5.625)}$
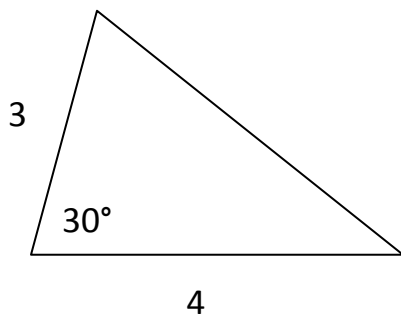
Area = $\sqrt{42.1875}$

Area = 6.495 cm^2

3. **Trigonometric Formula**

It is possible to calculate the area of a triangle if you know the length of two sides and the measure of the contained angle (**sandwich**). *Hint: this formula is usually used with the Sine Law*

$$\text{Area} = \frac{a \times b \times \sin C}{2}$$
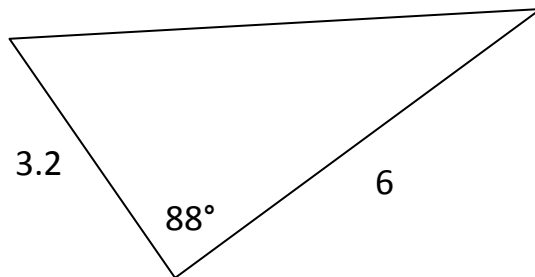
Example:

$$\text{Area} = \frac{a \times b \times \sin C}{2}$$

$$\text{Area} = \frac{3 \times 4 \times \sin 30}{2}$$

$$\text{Area} = \frac{12 \times 0.5}{2}$$

$$\text{Area} = \frac{6}{2}$$

$$\text{Area} = 3 \text{ cm}^2$$

$$\text{Area} = \frac{a \times b \times \sin C}{2}$$

$$\text{Area} = \frac{3.2 \times 6 \times \sin 88}{2}$$

$$\text{Area} = \frac{19.2 \times 0.99}{2}$$

$$\text{Area} = \frac{19.18}{2}$$

$$\text{Area} = 9.5 \text{ cm}^2$$