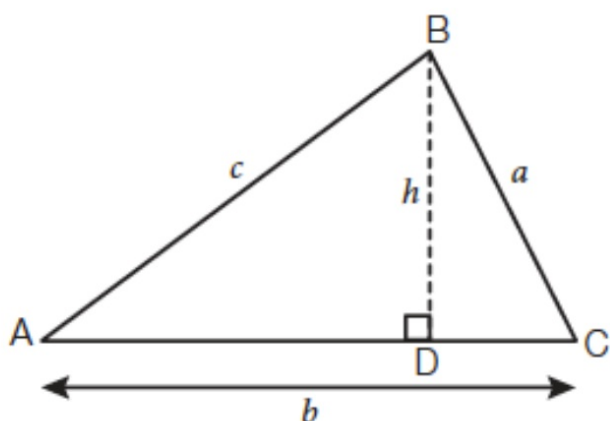


Lesson 15.6 - Area of a Triangle



We know that the area of a triangle can be found by the formula:

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

What happens if we do not know h ?

Use $S = \frac{O}{H}$

For Example, using angle C:

$$(a) \sin C = \frac{h}{a} \quad (a)$$

$$h = a \sin C$$

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

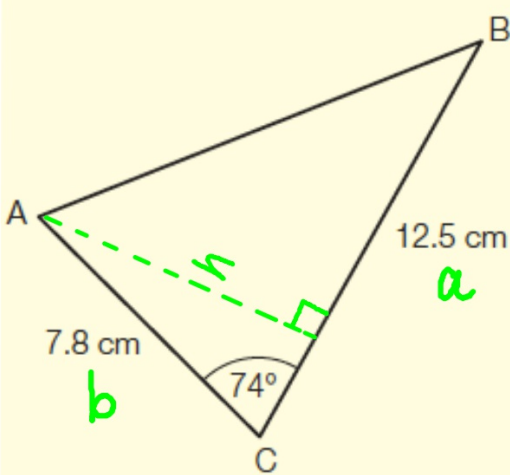
$$\textcircled{2} \text{ Area} = \frac{1}{2}ac \sin B$$

$$\textcircled{3} \text{ Area} = \frac{1}{2}bc \sin A$$

The formula that you use will depend on what you are given!

EXAMPLE #1

Find the area of triangle ABC.



Method #1:

$$\sin 74 = \frac{h}{7.8}$$

$$7.8 \sin 74 = h$$

$$7.5 = h$$

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

$$= \frac{1}{2}(12.5)(7.5)$$

$$= \boxed{46.9 \text{ cm}^2}$$

Method #2:

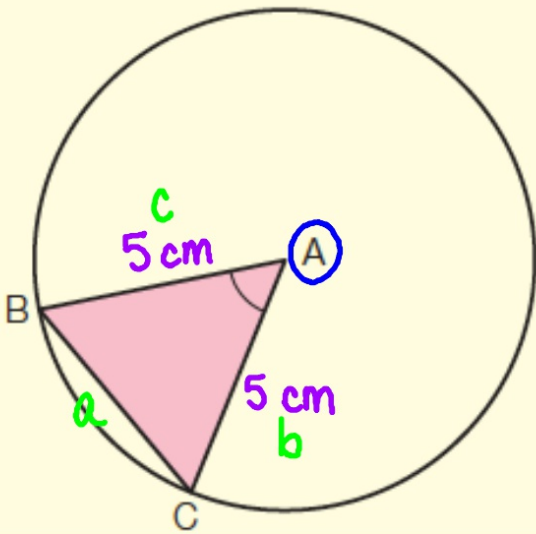
$$\text{Area} = \frac{1}{2}ab \sin C$$

$$= \frac{1}{2}(12.5)(7.8) \sin 74$$

$$= \boxed{46.9 \text{ cm}^2}$$

EXAMPLE #2

This circle has a radius of 5 cm and the area of the triangle is 11 cm^2 . Find the size of the acute angle \hat{BAC} .



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

$$11 = \frac{1}{2}(5)(5)\sin A$$

$$\frac{11}{12.5} = \frac{12.5\sin A}{12.5}$$

$$.88 = \sin A$$

$$\sin^{-1}(.88) = A$$

$$\boxed{61.6^\circ = A}$$