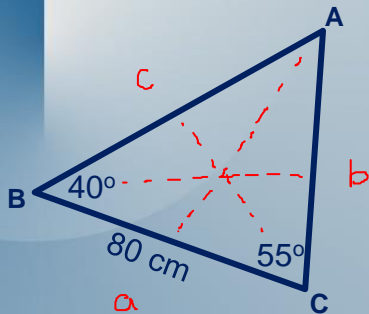


Warm Up

Find $m\overline{AB}$.



$$\angle BAC = 180 - 40 - 55 = 85^\circ$$

$$\Rightarrow \frac{\overline{AB}}{\sin(55)} = \frac{80}{\sin(85)}$$

$$\therefore m\overline{AB} = \frac{80\sin(55)}{\sin(85)} = 65.78m$$

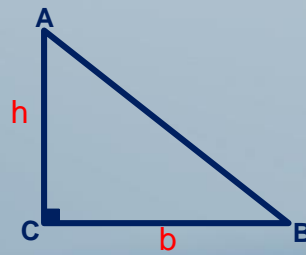
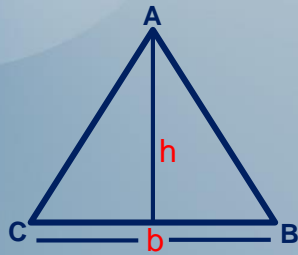
Lesson 17

Trigonometry – Area of Triangles

Area of a Triangle

There are 3 methods of calculating the area of a triangle:

1- General Formula $A = \frac{bh}{2}$

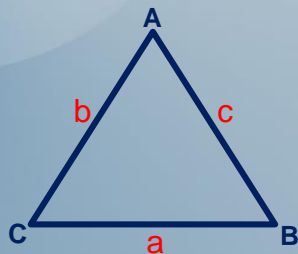


Area of a Triangle

If three sides of a triangle are given we can find the area using:

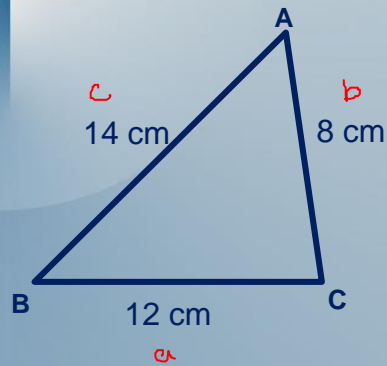
2- Hero's Formula $A = \sqrt{p(p-a)(p-b)(p-c)}$

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



Example 1

Find the area of this triangle.



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

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

$$p = \frac{12+8+14}{2} = \frac{34}{2} = 17$$

$$A = \sqrt{17(17-12)(17-8)(17-14)}$$

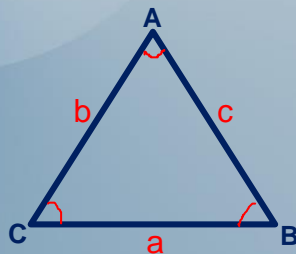
$$A = \sqrt{17(5)(9)(3)} = \sqrt{2295}$$

$$\therefore A \approx 47.91 \text{ cm}^2$$

Area of a Triangle

If two sides of a triangle and the angle in between are given we can find the area using:

3- Trigonometric Formula (Sandwich)



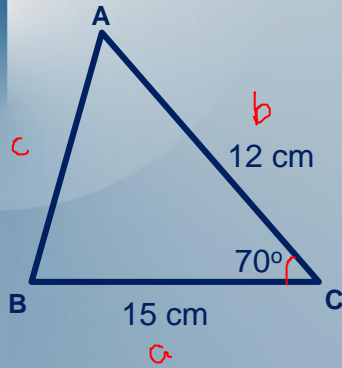
$$A = \frac{bc \sin A}{2}$$

$$A = \frac{ac \sin B}{2}$$

$$A = \frac{ab \sin C}{2}$$

Example 2

Find the area of this triangle.



$$A = \frac{ab \sin C}{2}$$

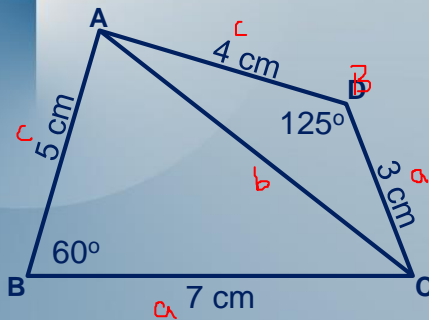
$$A = \frac{15 * 12 * \sin 70}{2}$$

$$A = \frac{169.14}{2}$$

$$\therefore A \approx 84.6 \text{ cm}^2$$

Example 3

Find the area of ABCD.



$$\therefore A_T \approx 20.07 \text{ cm}^2$$

$$A = \frac{ac \sin B}{2}$$

$$A = \frac{5 * 7 * \sin 60}{2}$$

$$A = \frac{30.31}{2}$$

$$\therefore A \approx 15.16 \text{ cm}^2$$

$$A = \frac{ac \sin D}{2}$$

$$A = \frac{3 * 4 * \sin 125}{2}$$

$$A = \frac{9.83}{2}$$

$$\therefore A \approx 4.91 \text{ cm}^2$$

Homework

Workbook

Textbook Vol 2

P. 110 #6

P. 111 #8-10