

Today's Learning Goal(s):

By the end of the class, I will be able to:

- a) solve triangle problems involving the sine and cosine laws.

5.5.1: Solving Problems Involving the Sine Law and the Cosine Law

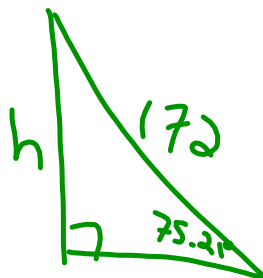
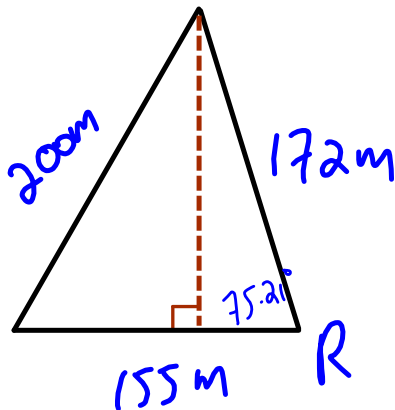
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Ex. 1 A triangular park has sides of length 200 m, 155 m, and 172 m.
Calculate the area of the park.

☞ Sketch a diagram.

☞ What formula do we need?

$$\text{☞ } A = \frac{bh}{2}$$



$$\cos R = \frac{172^2 + 155^2 - 200^2}{2(172)(155)}$$

$$R = \cos^{-1}\left(\frac{13609}{53320}\right)$$

$$\approx 75.212$$

$$\approx 75.21^\circ$$

SOH:

$$\sin 75.21^\circ = \frac{h}{172}$$

$$h = 172 \sin 75.21^\circ$$

$$\approx 166.3012$$

$$\approx 166.301$$

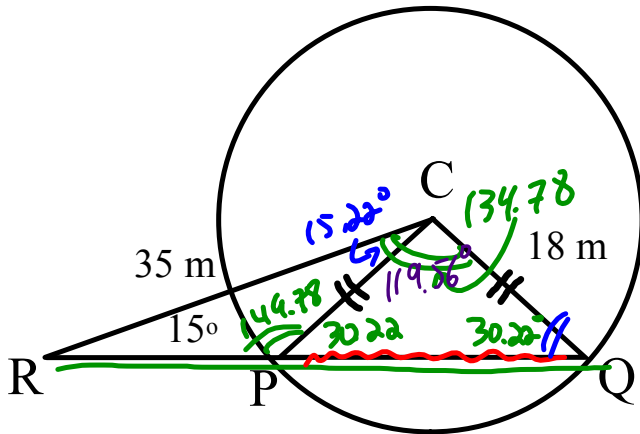
$$A = \frac{1}{2}bh$$

$$\approx \frac{1}{2}(155)(166.301)$$

$$\approx 12888.3275$$

$$\approx 12888.328 \text{ m}^2$$

Wkst 5.4.2 #12a Find PQ



$$PQ = RQ - RP$$

$$\frac{\sin Q}{35} = \frac{\sin 15^\circ}{18}$$

$$Q = \sin^{-1}\left(35 \times \frac{\sin 15^\circ}{18}\right)$$

$$\doteq 30.215$$

$$\doteq 30.22^\circ$$

$$\frac{PQ}{\sin 119.56^\circ} = \frac{18}{\sin 30.22^\circ}$$

$$PQ = \sin 119.56^\circ \times \frac{18}{\sin 30.22^\circ}$$

$$\doteq 31.1075$$

$$\doteq 31.108 \text{ m}$$