

What's Going On?

Checking In

Minds on

Using the Cosine Law

Action!

The Cosine Law for Angles

Consolidation

Which Tool?

Learning Goal - I will be able to use The Cosine Law to solve for sides and angles in non-right triangles.

$$\frac{50}{\sin C} = \frac{42}{\sin 60}$$

$$\cancel{50} \times \frac{\sin C}{50} = \frac{\sin 60 \times 50}{42}$$

$$\sin C = 1.0310$$

impossible

Minds on

The Cosine Law

$$c^2 = a^2 + b^2 - 2 \times a \times b \times \cos C$$

$$c^2 = a^2 + b^2 - 2ab \times \cos C$$

What do you need?

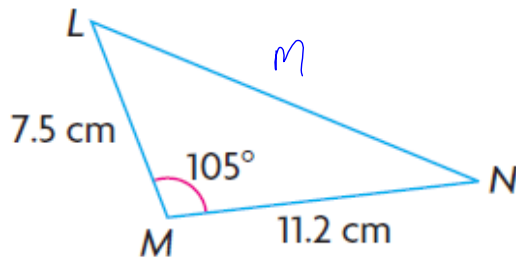
— Two sides and the contained angle.

OR

— All three sides

Minds on

Using the Cosine Law



$$m^2 = l^2 + n^2 - 2ln \cos M$$

$$m^2 = 11.2^2 + 7.5^2 - 2 \times 11.2 \times 7.5 \times \cos 105$$

$$m^2 = 161.69 - 168 \times (-0.2598)$$

$$m^2 = 161.69 - (-43.4764)$$

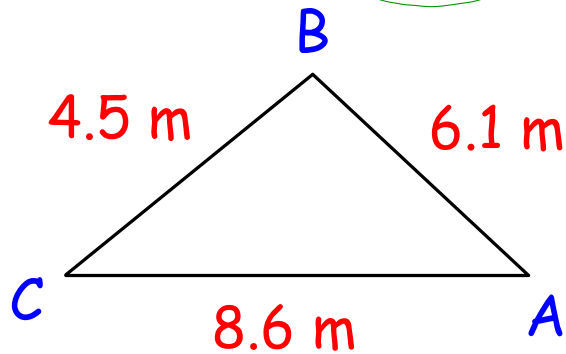
$$m^2 = 225.17$$

$$m = 15$$

Action!

The Cosine Law for Angles

Determine the measure of angle B



$$b^2 = a^2 + c^2 - 2ac \times \cos B$$

$$6.1^2 = 4.5^2 + 8.6^2 - 2 \times 4.5 \times 8.6 \times \cos B$$

$$73.96 = 57.46 - 54.9 \cos B$$

$$16.5 = -54.9 \times \cos B$$

$$\cos B = -0.3005$$

$$B = 107^\circ$$

Action!

The Cosine Law for Angles

Rearrange to solve for angle C

$$c^2 = a^2 + b^2 - 2ab \times \cos C$$

$$\frac{c^2 - a^2 - b^2}{-2ab} = \frac{-2ab \times \cos C}{-2ab}$$

$$\cos C = \frac{c^2 - a^2 - b^2}{-2ab} \left(\begin{array}{c} -1 \\ = \\ -1 \end{array} \right)$$

$$\cos C = \frac{-c^2 + a^2 + b^2}{2ab}$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$C = \cos^{-1} \left(\frac{a^2 + b^2 - c^2}{2ab} \right)$$

Action!

Using the Cosine Law

Consolidation

Which Tool?

Create a situation where you would use each of our trigonometric tools.

Include a sketch and an explanation of when you use each tool.