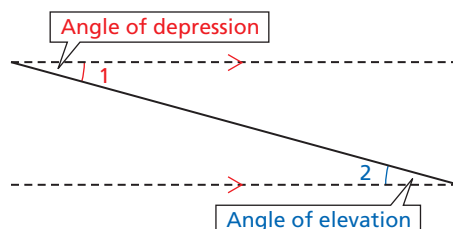


Section Overview

Angles of Elevation and Depression

Lesson 8-4

Why? Angles of elevation and depression can be used to calculate distances. For example, you can find the difference in elevation from the top to the bottom of a ski slope.



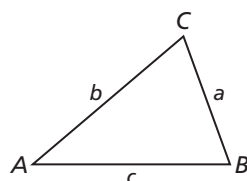
Because $\angle 1$ and $\angle 2$ are alternate interior angles formed by parallel lines, they are congruent.

Law of Sines and Law of Cosines

Lesson 8-5

Why? You can use the Law of Sines and the Law of Cosines to solve any triangle—not just right triangles.

For any $\triangle ABC$ with side lengths a , b , and c :



The Law of Cosines

$$\begin{aligned} a^2 &= b^2 + c^2 - 2bc \cos A \\ b^2 &= a^2 + c^2 - 2ac \cos B \\ c^2 &= a^2 + b^2 - 2ab \cos C \end{aligned}$$

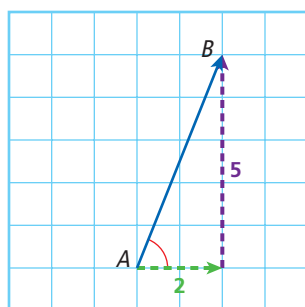
The Law of Sines

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Vectors

Lesson 8-6

Why? A vector is a quantity that has both magnitude and direction. Vectors can be used to describe forces, such as velocity and current.



The directed line segment from A to B is called **vector AB** , written \vec{AB} .

The **component form** $\langle x, y \rangle$ of a vector gives the **horizontal** and **vertical** change from its initial point to its terminal point.

The component form of \vec{AB} is $\langle 2, 5 \rangle$.

The **magnitude** of a vector is its length.

$$|\vec{AB}| = \sqrt{2^2 + 5^2} = \sqrt{29} \approx 5.4$$

The magnitude of \vec{AB} is about 5.4.

The **direction** of a vector is the angle it makes with a horizontal line.

$$\tan A = \frac{5}{2}, \text{ so } m\angle A = \tan^{-1}\left(\frac{5}{2}\right) \approx 68^\circ$$

The direction of \vec{AB} is about 68° .