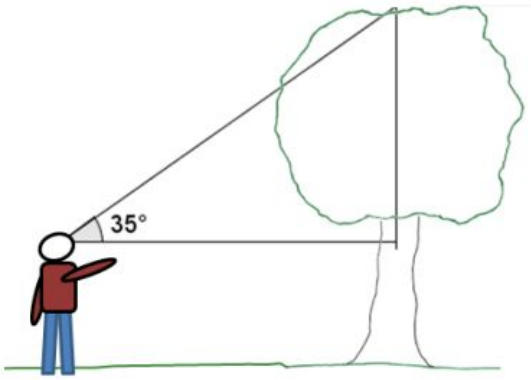
Lesson 2.6.5: Unknown Angles

Targets:

1. I know what the inverses of sine, cosine, and tangent are.
2. I can use ArcSine, ArcCosine, and ArcTangent to find missing angles.

Warm Up

Dan was walking through a forest when he came upon a sizable tree. Like any normal person, Dan wanted to estimate the size of the tree so he made some rough estimations in his head to help. Dan estimated he was about 40 meters away from a tree when he measured the angle of elevation between the horizontal and the top of the tree to be 35 degrees. If Dan is about 2 meters tall, about how tall is the tree?

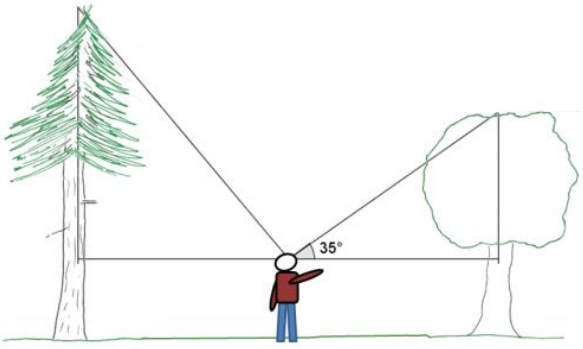


Finding Missing Angles

Dan was pretty impressed with this tree … until he turned around and saw a bigger one, also 40 meters away but in the other direction. "Wow," he said. "I bet that tree is at least 50 meters tall!" Then he thought a moment. "Hmm … if it is 50 meters tall, I wonder what angle of elevation I would measure from my eye level to the top of the tree?"

- What angle will Dan find if the tree is 50 meters tall?

- Explain your reasoning.



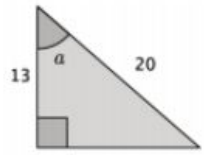
Inverse Trig Function

Watch the video and copy the notes here:

Practice 1

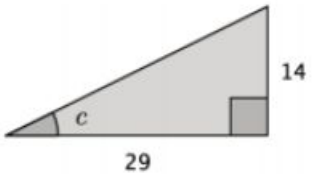
Find the measure of angles a–d to the nearest degree.

a.

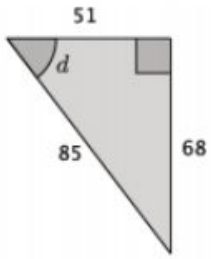


b.

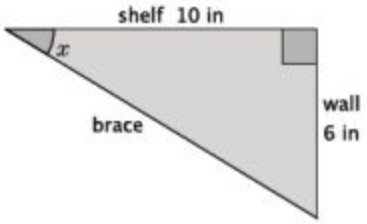
c.



d.



Practice 2



Shelves are being built in a classroom to hold textbooks and other supplies.
The shelves will extend 10 in from the wall. Support braces will need to be
installed to secure the shelves. The braces will be attached to the end of the
shelf and secured 6 in below the shelf on the wall. What angle measure will the brace and the shelf make?

Practice 3

A 16 ft ladder leans against a wall. The foot of the ladder is 7 ft from the wall. Draw a right triangle that will represent this situation. Include the given measurements on the triangle you draw.

1. Find the vertical distance from the ground to the point where the top of the ladder touches the wall.

2. Determine the measure of the angle formed by the ladder and the ground.

Exit Ticket

1.) Explain the meaning of the statement, "arcsine (½) = 30°." Draw a diagram to support your explanation.

2.) Gwen has built and raised a wall of her new house. To keep the wall standing upright while she builds the next wall, she supports the wall with a brace, as shown in the diagram below. What is value of *p*, the measure of the angle formed by the brace and the wall?