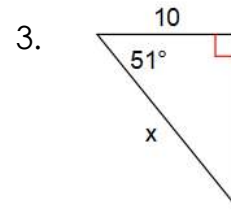
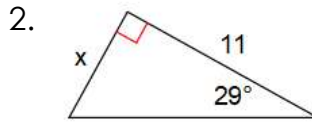
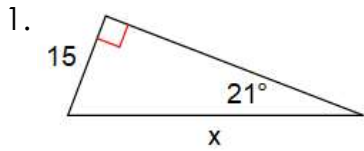
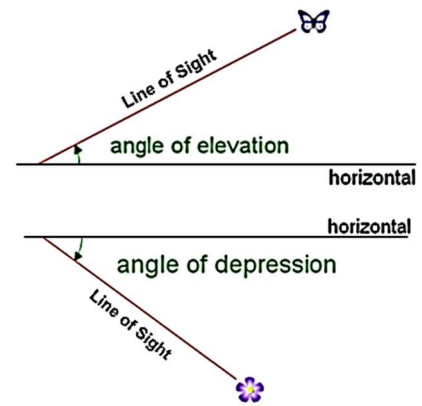


Warm-up: Find the missing side length.

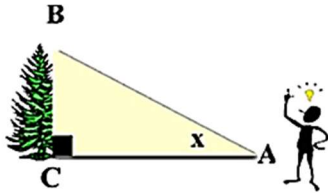


Elevation vs Depression

The **angle of elevation** is the angle from the horizontal looking up to some object.

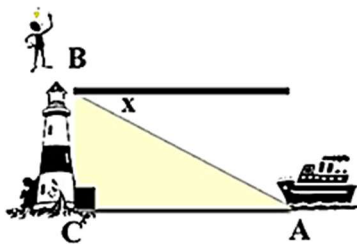


The **angle of depression** is the angle from the horizontal looking down to some object.



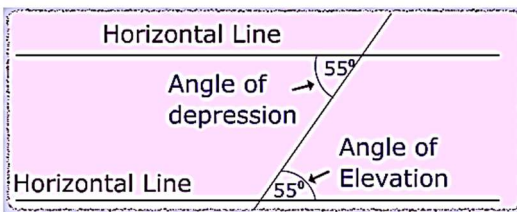
In the diagram at the left, x marks the angle of **elevation** of the top of the tree as seen from a point on the ground.

It is always **inside** the triangle.



In the diagram at the left, x marks the angle of **depression** of a boat at sea from the top of a lighthouse.

It is always **outside** the triangle.



Why does it appear that an angle of elevation and an angle of depression are the SAME?

- parallel lines cut by a **transversal**
- **Alternate Interior Angles** are congruent

Applications of Trig- Side Lengths

Round all answers to the nearest hundredth.

1. At a point 20 meters from a flagpole, the angle of elevation of the top of the flagpole is 48° . How tall is the flagpole?

2. A woman looks out from the top of a cliff to the ocean below. In the distance is a boat. If the boat is 3200 feet from the base of the cliff and the angle of depression to the boat is 15° , what is the direct distance from the woman to the boat?

3. As it leans against a building, a 9-meter ladder makes an angle of 55° with the ground. How far up the building does the ladder reach?

4. An owl is located in a huge oak tree and sees a food bowl for dogs in the distance. If the base of the tree is 250 feet from the food bowl, and the angle of depression from the owl is 20° , then what is the direct distance from the owl to the food bowl?

5. A flagpole is at the top of a building. 400 ft from the base of the building, the angle of elevation of the top of the pole is 22° and the angle of elevation of the bottom of the pole is 20° . Determine the length of the flagpole (to the nearest foot).

