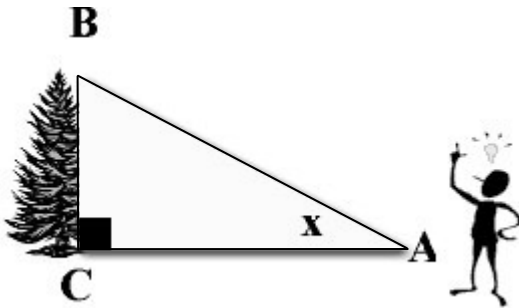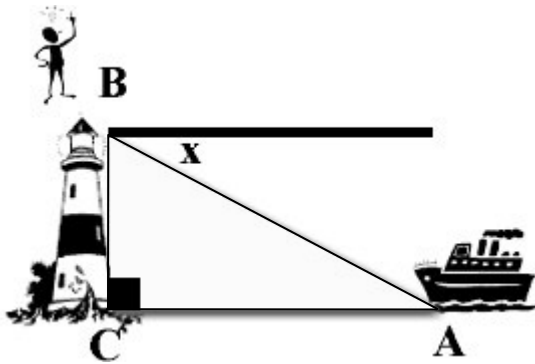### Angle of Elevation vs. Angle of Depression

Trigonometry is used on a daily basis in the workplace. Since trigonometry means "triangle measure", any profession that deals with measurement deals with trigonometry as well. Carpenters, construction workers and engineers, for example, must possess a thorough understanding of trigonometry.

Word problems introduce two new vocabulary terms:

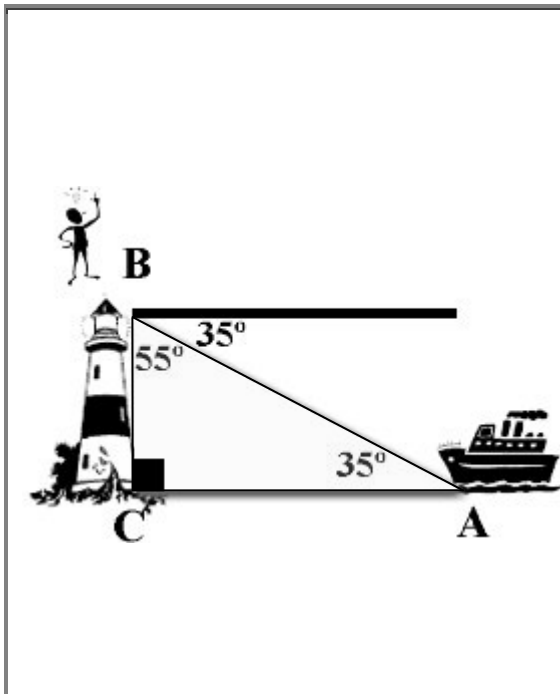| Angle of Elevation	The **angle of elevation** is always measured from the ground up. Think of it like an elevator that only goes up. It is always **INSIDE** the triangle.
B x C A	In the diagram at the left, **x** marks the angle of elevation of the top of the tree as seen from a point on the ground. You can think of the angle of elevation in relation to the movement of your eyes. You are looking straight ahead and you must raise (elevate) your eyes to see the top of the tree.
Angle of Depression	The **angle of depression** is always **OUTSIDE** the triangle. It is never inside the triangle.
B x C A	In the diagram at the left, **x** marks the angle of depression of a boat at sea from the top of a lighthouse. You can think of the angle of depression in relation to the movement of your eyes. You are standing at the top of the lighthouse and you are looking straight ahead. You must lower (depress) your eyes to see the boat in the water.

As seen in the diagram above, the dark black horizontal line is parallel to side CA of triangle ABC. This forms two alternate interior angles which are equal in measure. This tells us that:

the angle of elevation = the angle of depression.

"Angle of Elevation" is the angle formed between the horizontal and the line of sight when looking upward.

"Angle of Depression" is the angle formed between the horizontal and the line of sight when looking downward.

So what do we do with this angle of depression that is "OUTSIDE" of our triangle?

There are two possible ways to use our **angle of depression** to obtain an angle INSIDE the triangle.

1. find the angle adjacent (next door) to our angle. This adjacent angle will always be the complement of our angle. Our angle and the angle next door will add to 90°. In the diagram on the left, the adjacent angle is 55°.

2. utilize the fact that the **angle of depression = the angle of elevation** and simply place 35° in angle A. (the easiest method)

Once you have created your diagram, the word problems are solved in exactly the same manner as the problems we discussed earlier.

Steps for Solving Word Problems:

Step 1- Read the question carefully. Watch out for special terms like angle of elevation, etc.

Step 2- Draw the diagram of the right triangle described by the question.

Step 3- Label the diagram with all the information given by the question, such as angles and side lengths.

Step 4- Identify the angle in consideration and label its special sides.

Step 5- Identify the trigonometric ratio to be used to solve the triangle.

Step 6- Solve for the unknowns.