**Geometry Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Applications of Trig (Side Lengths) Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Warm-up: Find the missing side length.**

1. 2. 3.



**Elevation** vs **Depression**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the angle from the

horizontal looking up to some object.



The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the angle from the

horizontal looking down to some object.



In the diagram at the left, *x* marks the angle of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

of the top of the tree as seen from a point on the ground.

 It is always **\_\_\_\_\_\_\_\_\_\_\_** the triangle.

In the diagram at the left, *x* marks the angle of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

of a boat at sea from the top of a lighthouse.

 It is always **\_\_\_\_\_\_\_\_\_\_\_** the triangle.



**Why does it appear that an angle of elevation**

**and an angle of depression are the SAME?**

* parallel lines cut by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ are congruent

**Steps to Solving Trig Word Problems**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Examples.**

1. A tree casts a shadow 21 m long. The angle of elevation of the sun is 51o. What is the height of the tree?

2. A ladder 5 m long leans against a vertical wall and makes a 65o angle with the ground. How far is the foot of the ladder from the wall?

3. A small airplane climbs at an angle of 18o with the ground. Find the horizontal distance it has flown when it has reached an altitude of 800 m.

4. You are looking at a painting on the wall at the High Museum in Atlanta. You are standing 10 feet from the wall. Your angle of elevation to view the painting is 20o. (Your eyes are about 5 feet above the floor). Find how high the top of the painting is from the floor.

5. A little boy is flying a kite. The string of the kite makes an angle of 30o with the ground. If the kite is 9 meters in the air, find the length (in meters) of the string the boy used.

6. An operator at the top of a lighthouse sights a sailboat. The point from which the sighting is made is 24 m above sea level. The angle of depression of the sighting is 10o. How far is the boat from the base of the lighthouse?

7. A guy wire reaches from the top of a 120 m television transmitter tower to the ground. The wire makes a 63o angle with the ground. Find the length of the guy wire.