

**Trigonometry**  
**Right Triangle Word Problems**

Name \_\_\_\_\_  
Collected/Not Collected

For each situation, sketch and label a diagram then identify what you are to find. **If you know how to solve the problem then solve.**

1. A giant redwood tree casts a shadow 532 ft long. Find the height of the tree if the angle of elevation of the sun is  $25.7^\circ$ .
  
  
  
  
  
  
  
  
  
  
2. From a point on the ground 500ft from the base of a building, an observer finds that the angle of elevation to the top of the building is  $24^\circ$  and that the angle of elevation to the top of a flagpole atop the building is  $27^\circ$ . Find the height of the building and the length of the flagpole.
  
  
  
  
  
  
  
  
  
  
3. A 40ft ladder leans against a building. If the base of the ladder is 6ft from the base of the building, what is the angle formed by the ladder and the building?
  
  
  
  
  
  
  
  
  
  
4. The angle of elevation to the top of the Empire State Building in New York is found to be  $11^\circ$  from the ground at the distance of 1 mi from the base of the building. Using this information, find the height of the Empire State Building.

5. A plane is flying within sight of the Gateway Arch in St. Louis, at an elevation of 35,000 ft. The pilot would like to estimate her distance from the Gateway Arch. She finds that the angle of depression to a point on the ground below the arch is  $22^\circ$ .
- What is the distance between the plane and the arch?
  - What is the distance between a point on the ground directly below the plane and the arch?
6. From the top of a 200ft lighthouse, the angle of depression to a ship in the ocean is  $23^\circ$ . How far is the ship from the base of the lighthouse?
7. To measure the height of the cloud cover at an airport, a worker shines a spotlight upward at an angle  $75^\circ$  from the horizontal. An observer 600 m away measures the angle of elevation to the spot of the light to be  $45^\circ$ . Find the height  $h$  of the cloud cover.