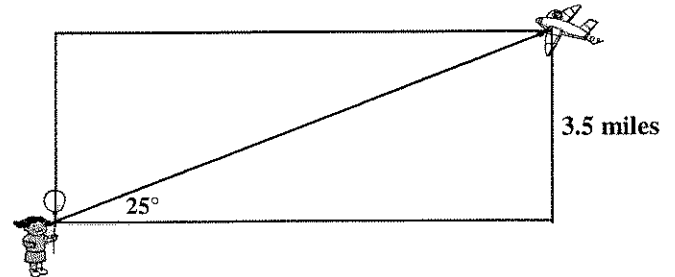


**Trigonometry Applications****Set up equations that could be used to solve each problem.****Step 1: Draw a picture****Step 2: Label picture****Step 3: Pick the best trig ratio****Step 4: Set up equation***Angle of depression – looking down from a horizontal line**Angle of elevation – looking up from a horizontal line*

**Ex. 1** Angie looks up at 25 degrees to see an airplane flying toward her. If the plane is flying at an altitude of 3.5 miles, how far is it from being directly above Angie?



**Ex. 2** A six foot vertical pole casts a shadow of 11 feet. What is the angle of elevation with the ground?

**Ex. 3** Lauren is at the top of a 15 meter tall lookout tower. She looks down at an angle of depression of  $25^\circ$  and sees Evan coming toward her. How far is Evan from the base of the tower?

1. What is the angle of elevation if you stand 850 feet away from a cliff that is 400 feet high and look at the top?
2. The string of a flying kite makes an angle of  $63^\circ$  with the ground. If all 250 feet of string are out, and there is no sag in the string, how high is the kite?
3. Tal's hill at Minute Maid Park has an elevation of  $30^\circ$ . If the hill has a six foot vertical rise, how long is its hypotenuse?

4. Joey is putting up an antenna. At the 30 foot mark, he attaches a 50 foot guy wire. What angle does the guy wire form with the antenna?
  
5. A person at the top of a cliff 100 feet tall sees Gilligan's boat. His sighting of the boat is at an angle of depression of  $10^\circ$ . How far is the boat from the base of the cliff?
  
6. A 24 foot ladder is leaned against a wall at  $55^\circ$  with the ground. How far away from the wall is the base of the ladder?
  
7. A 32 in. bat is leaning against a fence. If the bat is 15 in. away from the base of the fence, what angle is formed between the ground and the bat?
  
8. A plane takes off at an elevation of  $20^\circ$ . In its path, 500 feet away from the takeoff point, is a 170-ft tall tower. Will the plane clear the tower? If yes, by how much?
  
9. Ana knows that she is one mile from the base of a tower. Using a protractor she estimates an angle of elevation to be  $3^\circ$ . How tall is the tower to the nearest foot? (1 mile = 5280 feet)
  
10. The base of an isosceles triangle has a length of 16cm. and the vertex angle measures  $68^\circ$ . What is the length of each leg? Round to the nearest tenth of a cm.
  
11. Matt hiked to the top of the smaller cliff shown below. From the top, he could see the bottom of the large cliff at an angle of depression of  $25^\circ$ . He could see the top of the large cliff at an angle of elevation of  $20^\circ$ . Find the height of each cliff ( $x$  and  $y$ ).

