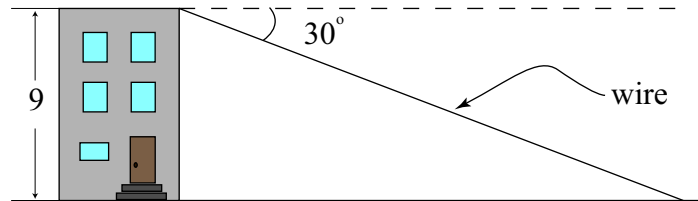
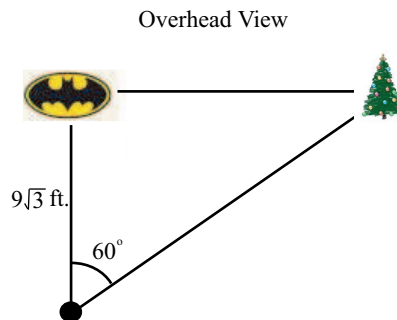
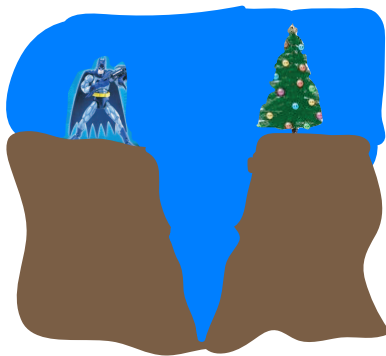


Worksheet for section 8.2 (Due Friday 11/11)

1. A wire is to be stretched from the top of an 9-meter-high building to a point on the ground. From the top of the building, the angle of depression to the ground point is 30° . How long must the wire be?



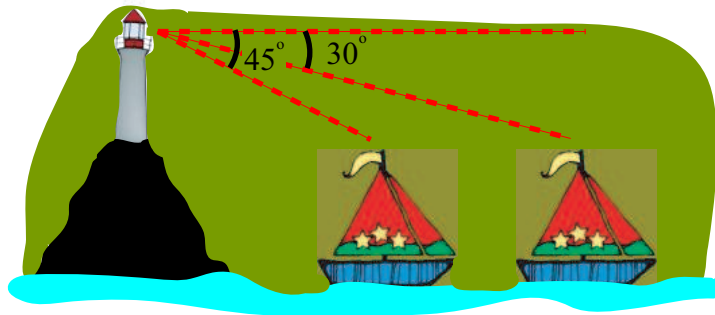
2. Batman is on the edge of a 200-foot-deep chasm and needs to jump to the other side. A Christmas tree on the edge of the chasm is directly across from him. He walks exactly $9\sqrt{3}$ feet to his right and notes that the angle to the tree is 60° . His jet belt enables him to jump a maximum of 24 feet. How wide is the chasm? Is it safe for Batman to jump?



3. A 150-foot-long ramp connects a ground-level parking lot with the entrance of a building. If the entrance is 8 feet above the ground, what angle does the ramp make with the ground? Draw a picture.

4. Jessica is flying a kite. Her hand is 3 feet above ground level and is holding the end of a 300-foot-long kite string, which makes an angle of 45° with the horizontal. How high is the kite above the ground? Draw a picture.

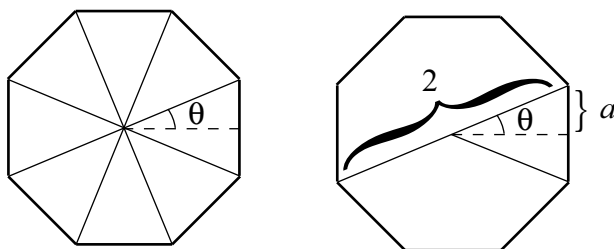
5. The sails of two boats lie on a straight line with a lighthouse. The top of the lighthouse is 23 meters above the tops of the sails. From the top of the lighthouse it is observed that the angle of depression of the nearest boat is 45° and the angle of depression of the farthest boat is 30° as pictured below. How far apart are the boats' sails?



6. The shape of a stop sign is a regular octagon (an 8-sided figure with all sides the same length and all angles the same measure). The perimeter of the stop sign is the sum of the lengths of all the edges. Given that the distance from one corner of a stop sign to the opposite corner is 2 feet, what is the perimeter of the stop sign ?



[Hint: Using the diagrams



first find the measure of θ , then use the half-angle identity to find $\sin \theta$. Now use this to find a and then find the perimeter.]