Lab on Right Triangles

1. sec 55.8 (1 point)

Refer to lab page 2. The initial measure of angle *CAB* is 55.8^o. ***Use the lengths of sides in the figure*** and the definition of the cosecant function as a ratio to calculate $\csc(55.8^o)$. Report your answer correct to 3 decimal places.

2. Hypotenuse (1 point)

Refer to lab page 2. How long is the hypotenuse of an isoceles right triangle whose sides are of length 3 units? Drag the points *A* and *B* to decide. Answer correct to 2 decimal places.

3. 5-12-13 angle (1 point)

Refer to lab page 2. Suppose we want the measure in degrees of the smallest angle in a 5-12-13 right triangle. The units in the figure aren't the right size to make a picture easy to interpret. Figure out a way to use similar triangles in the figure so you can view this angle in a triangle that fits in the figure's viewing area. Give the number of degrees correct to the nearest tenth of a degree.

4. hypotenuse (1 point)

Refer to lab page 2. "Solving" a right triangle involves giving all angle measures and side lengths, once you are given some partial information. Eventually we will learn how to solve an arbitrary triangle analytically, but with the figure above you can recover missing information for the right triangle directly, by adjusting the positions of the points *A*, *B*, and *C*. Adjust the figure to find the length of the hypotenuse if *AC* (side *b* in the figure) is 2.75 inches and angle *CAB* is 50.0^o. Report the length to as many decimal places as the figure provides.

5. Angle (1 point)

Refer to lab page 2. "Solving" a right triangle involves giving all angle measures and side lengths, once you are given some partial information. Eventually we will learn how to solve an arbitrary triangle analytically, but with the figure above you can recover missing information for the right triangle directly, by adjusting the positions of the points *A*, *B*, and *C*. Adjust the figure to make *AC* (side *b* in the figure) 2.75 inches and angle *CAB* 50.0^o. Find the measure of the other acute angle in degrees.

6. Tan 90 (3 points)

Refer to lab page 2. How about the tangent of 90^o? What problem arises with the ratio defining the tangent function when angle *CAB* gets larger and larger, approaching 90^o? Explain the situation in a sentence.
Refer to lab page 3. Graph the function tan(x). How does the problem above show up as a feature of the function graph? Explain the situation in a sentence.

Paragraph

7. sec 0 (1 point)

Refer to lab page 2. Study limiting ratios in the figure to decide what value should be
assigned to sec(0^o).

8. grads (1 point)

Use the Windows calculator to answer this question. Besides degrees and radians, another measure of angle size that is sometimes used is the *grad*. Scientific calculators often allow you to specify *deg*, *rad*, or *grad* as a mode for doing trigonometric calculations. If your calculator doesn't support grads, the Windows calculator in scientific view does. Perform the following experiment to figure out the relationship between the different ways of measuring angles. Pick a convenient angle in degrees (say 45) and calculate the sin of the angle. Now set the calculator to grad mode and find the smallest positive grad measure of the angle that works to give a matching value of the sin function. Scale your answer up to decide how many grads there are in a complete revolution, corresponding to 360^o.