Homework 16

(due December 8)

Math 130 *Kovitz* 2016

1. A right triangle has an acute angle θ with $\csc \theta = \sqrt{3}$.

   Find the exact values of the sine, cosine, tangent, and cotangent of θ, and of the sine and cosine of 2θ.

2. A right triangle has an acute angle θ with $\csc \theta = 2.6 = \frac{13}{5}$.

   Find the exact values of the sine, cosine, tangent, and cotangent of θ, and of the sine and cosine of 2θ.

   Is 2θ bigger than $45°$? Why or why not? (Calculator not needed to decide.)

   From the exact values of $\sin 2\theta$ and $\cos 2\theta$ and the Pythagorean identity, can you conclude that $120^2 + 119^2 = 169^2$? Why?

3. Assume that x satisfies $\frac{\pi}{2} < x < \pi$ and that $\sin x = \frac{12}{13}$.

   (a) Find $\sin 2x$.

   (b) Find $\cos 2x$.

   (c) Find $\tan 2x$.

4. The same as Problem 3 except that $\sin x = \frac{4}{5}$ and x is in the first quadrant.

5. Find an expression equivalent to $\cos x \, \tan x$ that contains at most one trig function.