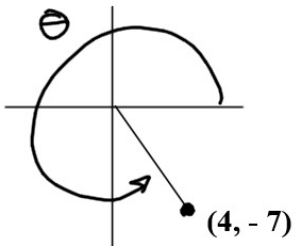
MAT 1420 Week 3 Written Assignment
65 pts Covers Section 1.7 – 1.9

Be sure to follow College Algebra formatting guidelines in your work.

My biggest gripe with trig students is they don't draw the pictures corresponding to the problem situations. If you can't draw the picture, I conclude you don't really know what you're doing. If you know what you're doing, you *want* to draw the picture, to *help you see*!

1. (5 pts) Find the exact values of the six trigonometric functions of the angle θ shown on the right.



2. (5 pts) Determine the quadrant in which the angle θ lies if $\sin(\theta) < 0, \cos(\theta) < 0$.

3. (5 pts) Find the *exact* values of the remaining trig functions if $\tan(\theta) = \frac{3}{7}, \cos(\theta) < 0$.

4. (5 pts) The terminal side of θ lies on the line $y = \frac{7}{3}x$ in Quadrant I. Find the value of the six trigonometric functions of θ, by using any point on the line (I suggest up 7, right 3 from (0, 0).).

5. (5 pts) Sketch the angle θ in standard position. Then find and label the reference angle θ' for $\theta = \frac{7\pi}{6}$.

6. (5 pts) Sketch the angle θ in standard position. Then find and label the reference angle θ' for $\theta = 207^0$.

7. Sketch the equation situation and find 2 solutions to each of the following. Give final answers in both radians and degrees, to 4 decimal places.

   a. (5 pts) $\sin(\theta) = -\frac{3}{5}$

   b. (5 pts) $\sec(\theta) = -\frac{7}{4}$

8. (5 pts) Sketch one period of the graph of $y = 5\sin\left(\frac{\pi}{3}x - \frac{11\pi}{3}\right) + 3$. If you followed along in class, then you know the easiest period to graph, and that's the period I most want to see. Label high points, low points and midline points. State the period, amplitude, horizontal shift, and vertical shift involved in the making of your graph.

9. (5 pts) In the 1.5 #4 on the WebAssign Homework, it says that $y = a\cos(bx - c) + d$ is a vertical translation of the basic function. Actually, it's a vertical stretch/shrink, horizontal stretch/shrink, a horizontal translation *and* a vertical translation of the basic curve. I just wanted to point that out. I'm not sure what WebAssign's thinking.

10. Suppose in some northerm clime, the hours of daylight on the longest day of the year is 22 hours and on the shortest day of the year is 2 hours.

    a. (5 pts) Build a cosine function that models this situation, where x gives the day of the year. The input will be the day (as a number) of the year, and the output will be the number of hours of daylight on that day.

    b. (5 pts) Assuming that there's a 12-hour day on the Spring and Fall equinoxes, and that all else remains the same. build a *sine* function that models this situation.

    c. (5 pts) Confirm with a graphing utility that your answers to parts a and b are identical!

Facts to know: Winter Solstice is the shortest day. It falls on December 21st.
Spring Equinox falls on March 21st.
Summer Solstice falls on June 21st.
Fall Equinox falls on September 21st.