Test 1 Math 159

Place your name in the upper right hand corner. Place your answers in the blanks at the left. Show your work on a separate sheet. Relax and enjoy the test. :-)

1) Compute the value to 3 decimal places for the following trigonometric functions.
   ________ a) $\sin(30^\circ)$  ________ d) $\cos(\pi/4)$
   ________ b) $\tan(45^\circ)$  ________ e) $\csc(\pi/2)$
   ________ c) $\sec(60^\circ)$  ________ f) $\cot(\pi/4)$

2) Suppose a rock orbits the earth at an altitude of 200 miles (you may assume that the radius of the earth is 3950 miles). Suppose that it takes 1 hour and 15 minutes to make one complete orbit. How fast is it going?

3) On the back of this page draw a graph of
   \[ y = 2\sin(\pi x \div \pi/2) \quad 1 \leq x \leq 1 \]
   What is the amplitude, frequency, period and phase shift?

4) Find a, b, and c so that $y = a\sin(bx + c)$, matches the graph below.

   ![Graph of y = a\sin(bx + c)]

5) Given that $\sin(\theta) = \frac{1}{\sqrt{3}}$, and that the angle is in the first quadrant fill in the table below.
   \[
   \begin{array}{llll}
   \sin(\theta) &=& \csc(\theta) &=& \cot(\theta) = \\
   \sec(\theta) &=& \tan(\theta) &=& \theta = 
   \end{array}
   \]

6) A plane flies in a direction of 85 degrees east of north. It then flies in a direction of 200 degrees east of north for 150 miles. It is then 195 miles from its starting point. How far did the plane fly on the 85 degrees east of north leg?

7) A light house keeper 100 feet above the water sees a boat sailing in a straight line toward her. As she watches, the angle of depression to the boat changes from 25 degrees to 40 degrees. How far did the boat travel in that time?

8) A pole tilts 12 degrees from the vertical, away from the sun, and casts a 34 foot shadow on the level ground. The angle of elevation from the end of the shadow to the top of the pole is 64 degrees. How long is the pole?