Math 105: Trigonometry
Worksheet 2, Due Thursday June 20th

1. Assume that $\cos\left(\frac{\pi}{8}\right) = \frac{\sqrt{2+\sqrt{2}}}{2}$. **Calculate the exact values for the following (show all your work).**

(a) $\sin\left(\frac{\pi}{8}\right)$

(b) $\cos\left(\frac{23\pi}{8}\right)$

(c) $\tan\left(\frac{7\pi}{8}\right)$

(d) $\cos\left(-\frac{31\pi}{8}\right)$

(e) $\tan\left(-\frac{23\pi}{8}\right)$

2. The original Ferris wheel (built by George Ferris in the 1980's) was significantly larger and slower than the Ferris wheels typically encountered today. It had a diameter of **250** feet and contained **36** cars, each of which held **40** people, and it made one revolution every **10** minutes. Imagine the Ferris wheel revolving counterclockwise in the xy-plane with its center at the origin. The car your class is sitting in has coordinates $(125, 0)$ at time $t = 0$. Find the rule of a function that gives the y-coordinate of the car at time t, where t is in minutes.