Group: _____   Present:_____

1. Set your grapher to PARAMETRIC mode. Set $T \in [0, 2\pi]$, TSTEP $= \frac{\pi}{100}$, viewing window $= [-1.5, 1.5] \times [-1, 1]$, $X_{1T} = \cos(T)$ and $Y_{1T} = \sin(T)$.
   Graph. Trace. What do you see? (Use ZSQUARE to get a better picture)

   Use function evaluation (2nd CALC 1:VALUE) to find coordinates for:
   $T = \frac{\pi}{6} : x = $ _____ , $y = $ _____
   Thus $\cos($____$) = $ _____ and $\sin($____$) = $ _____
   $T = \frac{2\pi}{3} : x = $ _____ , $y = $ _____
   Thus $\cos($____$) = $ _____ and $\sin($____$) = $ _____
   $T = \frac{7\pi}{3} :$ What happened? Why?

   Change window settings to find $\cos(\frac{7\pi}{3})$ and $\sin(\frac{7\pi}{3})$

   Thus $\cos(\frac{7\pi}{3}) = $ _____ and $\sin(\frac{7\pi}{3}) = $ _____

2. Write the Fundamental Trigonometric Identity: _____
   Suppose $\cos(t) = \frac{5}{13}$ and $\tan(t) < 0$. In which quadrant does t lie? Quadrant _____
   Find $\sin(t) = $ _____

   Find $\tan(t) = $ _____ and $\sec(t) = $ _____
   Find $\cot(t) = $ _____ and $\csc(t) = $ _____

3. Graph the following, in PARAMETRIC and SIMULTANEOUS mode. Set $T \in [0, 2\pi]$, viewing window $= [-2, 2\pi, 1] \times [-2.5, 2.5, 1]$. Then enter $X_{1T} = -1 + \cos(t), Y_{1T} = \sin(t)$ (a unit circle shifted one unit left) and $X_{2T} = t, Y_{2T} = \sin(t)$ ($y = \sin(x)$ graphed parametrically). Use ZSQUARE to get a better picture.

   What do you see? (TRACE, and use up and down arrows to jump between the two curves)

   For which x values is $\sin(x) = 0$? _____
   For which x values is $\sin(x) = -1$? _____
   For which x values is $\sin(x) = 1$? _____

4. Suppose you are standing on level ground 250 feet away from a tall building. If the top of the building is at an angle of elevation $65°$ from your current position, how tall is the building?
   (Draw a picture which clearly shows all the important information)