Math 05 – Spring 2011 – Take-home problems for Chapter 5 test

For each of this problems, show your own personal expression of the solution using a narrative style documenting each step in your derivation of the solution.

1. Suppose a conic section has a focus at (0,0), eccentricity $e = 2$, and a vertex at (9,0).
   a. Find a standard polar function for the conic.
   b. Find the standard rectangular equation for the conic.
   c. Construct a careful graph of the conic showing key components.
   d. Find parametric equations for the conic.
   e. Pick a point *P* on the conic which is not a vertex and show that the ration of the distance from that point to a focus to the distance from that point to the directrix is $\frac{d(P,F)}{d(P,\ell)} = e$

2. Suppose a conic section has a focus at (0,0), eccentricity $e = ½$, and a vertex at (0,-8).
   a. Find a standard polar function for the conic.
   b. Find the standard rectangular equation for the conic.
   c. Construct a careful graph of the conic showing key components.
   d. Find parametric equations for the conic.
   e. Pick a point *P* on the conic which is not a vertex and show that the ration of the distance from that point to a focus to the distance from that point to the directrix is $\frac{d(P,F)}{d(P,\ell)} = e$