1. Determine the shape and orientation of the following graphs;

    a. $4x^2 + 9y^2 - 16x - 18y = 11$

    b. $-4x^2 + 9y^2 - 16x - 18y = 11$

    c. $9x^2 + 9y^2 - 16x - 18y = 11$

    d. $4x^2 - 16x - 18y = 11$

2. Graph each of the above.

3. A parabolic mirror reflects light in a beam when the light source is placed at its focus.

    a. If the equation of the parabola for this reflector is $y^2 = 8x$, how far from the vertex of the parabolic reflector should the light source be placed? (all measurements are in feet.)

    b. If the parabolic reflector is 3 feet deep, how wide is it?