#### Precalculus Exercises: Chapter 7

# Section 7.2

1. Complete the square to find the center and radius of the circle given by the equation below. Then graph it.

$$x^2 - 4x + y^2 + 6y + 4 = 0$$

2. Find the standard equation of the circle with center (1,7) passing through the point (4,11).

### Section 7.3

1. Complete the square to put the equation in standard form. Identify the vertex, focus, and directrix, and graph the parabola:

$$3y^2 - 3y + 28 - x = 0$$

2. A parabolic arch is 10 feet wide at the base and 30 feet tall in the middle. A 6 foot tall man stands under the arch so that the tip of his head just touches the arch. How far from the center is he standing?

# Section 7.4

1. Complete the square to put the equation in standard form. Find the center, foci, and eccentricity of the ellipse and graph it.

$$9x^2 + 4y^2 - 54x + 16y + 61 = 0$$

2. Find the standard from of the equation of the ellipse with foci at  $(\pm 5, 0)$  and center at (0, 0).

# Section 7.5

1. Complete the square to put the equation in standard form. Find the center, foci and equations of asymptotes for the hyperbola, and graph it.

$$y^2 - 9x^2 - 4y + 18x - 14 = 0$$

2. For each of the following, put the equation in standard form and determine whether the equation is of that of a circle, parabola, ellipse, or hyperbola.

(a) 
$$x^2 - 2x - y^2 + 4y - 19 = 0$$
  
(b)  $y^2 - x - 4y - 12 - 0$   
(c)  $x^2 - 2x + y^2 - 4y - 11 = 0$   
(d)  $3x^2 + 2y^2 - 6x - 8y - 5 = 0$