Homework 8 - Math 105   Name: _____

Do not use a calculator unless it says **(Calc)** *next to the problem.*

1. Sketch a graph of the polynomial function $y = x^2 - 2x$. Be sure to label the graph an clearly indicate the locations of all roots and vertices of the polynomial.

2. Sketch a graph of the polynomial function $y = x^2 - 5x + 6$. Be sure to label the graph an clearly indicate the locations of all roots and vertices of the polynomial.

3. A farmer finds that if she plants 75 trees per acre, each tree will yield 20 bushels of fruit. She estimates that for each additional tree planted per acre, the yield of each tree will decrease by 3 bushels.

   (a) If x represents the number of trees per acre, find a formula for the amount of fruit y as a function of x.

   (b) **(Calc)** Graph the formula from part (a) and find the value of x that produces the most fruit y.

4. Solve $x^2 - 5x = 150$.

5. Solve $7y - y^2 < 10$.

6. Solve $\dfrac{3x^2 - 5x + 4}{x^2} = 2$.

7. **(Calc)** A rectangular courtyard is 18 meters long and 21 meters wide. Along the edge of the courtyard is a paved walkway that is x meters wide. The area inside the walkway is a rectangular garden that is 180 square meters. How wide is the walkway?

x

18 m   180 m^2

x 21 m