Name: _____

Optimization Problems

1) Find the length and width of a rectangle that has the perimeter 100 meters and the maximum area.

2) What is the largest possible area for a right triangle whose hypotenuse is 5 inches long?

3) The radius r of a circle is increasing at a rate of 3 centimeters per second. Find the rate of change of the area when r=6 centimeters.

4) The radius r of a sphere is increasing at a rate of 5 inches per minute. Find the rate of change of the volume when r=24 inches.

5) A ladder 25 feet long is leaning against the wall of a house. The base of the ladder is pulled away from the wall at rate of 3 feet per second.

   (a) How fast is the top moving down the wall when the base of the ladder is 15 feet from the wall?

   (b) Consider the triangle formed by the side of the house, the ladder, and the ground. Find the rate at which the area of the triangle is changing when the base of the ladder is 7 feet from the wall.