Math 1271 **Name:** _____

Worksheet: 3.5 3.6 3.9

1. Find dy/dx using implicit differentiation.

$$xe^y = x^2 - y \qquad \frac{x^2}{x+y} = y^2 + 1 \qquad y\sin(x) = e^y + x^2$$

2. Find second derivative using implicit differentiation.

$$x^3 - y^3 = 7$$

3. Find the tangent line to the parabola

$$\frac{x^2}{4} + \frac{y^2}{9} = 1$$

at the point (a, b).

4. Find the derivative of

$$f(x) = x^2 \ln(x) \qquad f(x) = \ln(1 + \ln(1 + \ln(x)))$$

5. Find dy/dx for

$$x^y = y^x \qquad y = (x^3+1)^2(x^2-3)^3$$

6. The surface area of a sphere is increasing at a rate of 4 m^2/s, how fast is the volume increasing, when the radius is 2 cm ?