Quiz 7 Calculus 1 10/7/2002

Each problem is worth 5 points. Show complete justification for full credit.

GREAT!

5 1. Use implicit differentiation to find y' if $x^2 + y^2 = 1$.

$$\frac{d}{dx}(x^2+y^2) = \frac{d}{dx}\,1$$

$$\frac{d}{dx}x^2 + \frac{d}{dx}y^2 = 0$$

$$2x + 2y \cdot y' = 0$$

$$y'(2y) = -2x$$

$$y' = \frac{-2x}{2y} = -\frac{x}{y}$$

5 2. Use implicit differentiation to find y' if $x^2y + xy^2 = 3x$.

$$x^2y + xy^2 = 3x$$

$$2xy + x^2y' + y^2 + x(2y \cdot y') = 3$$

$$2xy + x^2y' + y^2 + 2xyy' = 3$$

$$x^2y' + 2xyy' = 3 - 2xy - y^2$$

$$y'(x^2 + 2xy) = 3 - 2xy - y^2$$

$$y' = \frac{3 - 2xy - y^2}{x^2 + 2xy}$$