

Math S-Xab  
Worksheet—Implicit Differentiation and  
Related Rates

Summer 2004

1. The equation

$$x^5 + xy^3 + x^2y + y^5 = 32$$

implicitly defines a curve. What is the slope of the curve at  $(0, 2)$ ?  
Find the equation of the tangent line to the curve at this point.

2. Find the derivative of  $y$  in each of the following.

(a)  $4x^2 - 9y^2 = 36$

(b)  $(x^2 + y^2)^2 = 4x^2y$

(c)  $y = 2x^{\ln \sqrt[3]{x}}$

(d)  $y = \frac{x^2 e^x \sqrt{x^2 + 1}}{(x - 2)(x + 5)}$

