

Math Xa Fall 2003
Worksheet: Using the Chain Rule
December 12, 2003

1. Find the absolute maximum value of $y = \frac{3}{\sqrt{x^2 + 1}}$.

2. Given that f is a differentiable function, find an expression for the derivative of each of the following.

(a) $y = \frac{\ln x}{f(x)}$

(b) $y = x^2 e^x f(x)$

(c) $y = \sqrt{[f(x)]^3 - x^3}$

(d) $y = \frac{1}{f(f(x))}$

3. A holiday ornament is to be constructed by inscribing a right circular cone of brightly colored material in a transparent spherical ball of radius 2 inches. What is the maximum possible volume of such a cone?

4. Find $\frac{d}{dx}(x^x)$. (Hint: Write x^x as $e^{\ln x^x}$.)