

Math S-Xab
Worksheet—The Chain Rule

Summer 2004

1. Find the derivative of $y = \exp(x^2 + 4x - 2)$.
2. Find the derivative of $y = (x^2 + 4x - 2)^{10}$.
3. Find the derivative of $y = \ln\left(\frac{e^x(x^2 + x - 2)^{20}}{\sqrt{x^2 + 1}}\right)$.
4. Find the derivative of $y = \sqrt{x^2 - x + 5}$.

5. Find the largest value of

$$y = \frac{\ln(x+1)}{x+1}.$$

6. Find the global maximum of

$$y = \frac{3}{\sqrt{x^2+1}}.$$

7. A Christmas 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?