

Name:

Solutions

Quiz #3 - January 26, 2007

1. Find y' :

a. $y = \log_5(x^2 + 1)$.

b. $y = x^x$. (Hint: Take ln of each side first)

a. $y = \log_5(x^2 + 1)$

$$5^y = x^2 + 1$$

$$y = \frac{\ln(x^2 + 1)}{\ln 5}$$

$$y' = \frac{2x}{(x^2 + 1)\ln 5}$$

b. $y = x^x$

$$\ln y = x \ln x$$

$$\frac{1}{y} y' = \ln x + 1$$

$$y' = y(\ln x + 1)$$

$$= x^x(\ln x + 1)$$

2. Evaluate $\int_3^7 5^x dx$.

$$= \frac{5^x}{\ln 5} \Big|_3^7 = \frac{5^7 - 5^3}{\ln 5}$$

3. Evaluate:

a. $\log_a\left(\frac{1}{a}\right)$.

b. $\log_3(27)$

a. -1

b. 3

4. Neatly sketch and label the graph of $y = \left(\frac{1}{2}\right)^x$.

