



Homework 5.5 – Derivatives and Antiderivatives of Exponentials and Logarithms

1. (1 pt) [alfredLibrary/AUCI/chapter5/lesson5/logchain1pet.pg](#)

Recall, $\frac{d}{dt}(\ln t) = \frac{1}{t}$, but if y is a function of t , then $\frac{d}{dt}(\ln y) = \frac{1}{y} \cdot y'$. Use this "short cut" to find each derivative.

(a) $\frac{d}{dt}(\ln(t-10)) =$ _____

(b) $\frac{d}{dt}(\ln(5t+7)) =$ _____

(c) $\frac{d}{dt}(\ln(3t^2+9t+9)) =$ _____

2. (1 pt) [alfredLibrary/AUCI/chapter5/lesson5/logchain2pet.pg](#)

(a) If $f(x) = \sqrt{15 + \ln(x)}$, then $f'(3) =$ _____.

(b) If $f(x) = x(3.5)^x$, then $f'(x) =$ _____.

3. (1 pt) [alfredLibrary/AUCI/chapter5/lesson5/graphoffunction1pet.pg](#)

Let $f(x) = 5x^2 \ln(x)$, for $x > 0$.

(a) The derivative of f is $f'(x) =$ _____, $x > 0$.

(b) The critical numbers of f are $x =$ _____.

4. (1 pt) [alfredLibrary/AUCI/chapter5/lesson5/integralofreciprocal2pet.](#)

Evaluate the indefinite integral. You must first rewrite and simplify the integrand!

$$\int \frac{3 - 8xe^{8x}}{x} dx = \text{_____}.$$

5. (1 pt) [alfredLibrary/AUCI/chapter5/lesson5/integralofreciprocal1pet.](#)

Evaluate the definite integral. You must first rewrite and simplify the integrand!

$$\int_1^e \frac{5x^2 + 6x + 9}{x} dx = \text{_____}.$$