

Math 155 Worksheet 9

Name:

ID:

1. Find a formula for the inverse function of each of the following functions.

(a) $f(x) = \frac{4 \ln(x) - 1}{2 \ln(x) + 3}$.

(b) $f(x) = \frac{3 + 2e^x}{2 - 3e^x}$.

2. (Exercises 39, 40, on Page 159).

(a) Suppose that f^{-1} is the inverse function of a differentiable function f , and $f(4) = 5$, $f'(4) = \frac{2}{3}$. Find $(f^{-1})'(5)$.

(b) Suppose that f^{-1} is the inverse function of a differentiable function f , and let $G(x) = 1/f^{-1}(x)$. If $f(3) = 2$ and $f'(3) = \frac{1}{9}$, find $G'(2)$.

3 Compute the following.

(a) $\lim_{x \rightarrow \infty} \frac{2 + 3 \ln(x)}{4 - 5 \ln(x)}$.

(b) $\lim_{x \rightarrow 4^+} e^{6/(4-x)+x}$.

4. Suppose that $2e^{x^2y} = x + y$.

(a) Find y' .

(b) Find an equation of the tangent line to the curve $2e^{x^2y} = x + y$ at the point $(2, 0)$.

5. Find the derivative of these functions.

(a) $f(x) = \ln(x^2 + 10)$.

(b) $f(x) = e^{\cos(\ln(x))}$.

(c) $f(x) = e^{\sin(\sqrt[5]{x})}$

(d) $f(x) = \log_{10}\left(\frac{x}{x-1}\right)$.

(e) $y = \ln(\sec(x) + \tan(x))$. (This exercise might be useful later or in Cal II).