Math 203 Fall 2018 Professor MG
Classwork 7 Name: _____

Show all work and circle/box your final answer. All answers must be simplified unless stated otherwise.

1. (*0 points*) Simplify the following expressions:

(a) $\ln \frac{1}{e}$

(b) $e^{2 \ln x}$

2. (*0 points*) Use the properties of logarithms to write the expression as a sum, difference, or product of simpler logarithms.

(a) $\ln \frac{9\sqrt[3]{5}}{\sqrt[4]{3}}$

(b) $\ln\left(\frac{3xy}{5}\right)$

3. (*0 points*) Solve the following equations

(a) Solve $\ln x + \ln(3x) = -1$.

(b) $\ln(x) + \ln(x+1) = \ln(6)$

(c) $\ln x + \ln(x-3) = 1$

(d) $e^{\sqrt{x}} = 4$

(e) $e^{x^2-2x} = e^8$

4. (*0 points*) A continuously compounded interest account starts with 5000. 1 year later it has $10,000$. Solve for the rate constant r then find the amount in the account after 2 years.

5. (*0 points*) Find the following derivatives. You do not have to simplify your answer

(a) $y = -3e^{3x^2+5}$

(b) $y = x^2 e^{-2x}$

(c) $y = \ln\left|-8x^3 + 2x\right|$

(d) $f(x) = \frac{e^{2x+1}}{\ln(x^2)}$

(e) $f(x) = \ln(x^2+1)$

(f) $f(x) = e^{2x^2+4x}$

(g) $f(x) = \ln\left(\dfrac{(3x+1)^4}{x^4+5x+7}\right)$ (hint: rewrite the expression first)

(h) $f(x) = \dfrac{x^{2/3}(x-3)^{4/3}}{(2x+5)^{5/3}}$ (hint: use logarithmic differentiation)