

Name: Key

Math 152 Calculus II - Crawford

Quiz 1

11 September 2018

Books, notes (in any form), and calculators are not allowed. *Show all your work.* Good Luck!

1. (7 pts) Differentiate the following. [Do not simplify.]

(a). $f(x) = e^{-2x} \cos(4x)$

$$f'(x) = e^{-2x} (-\sin(4x)) \cdot 4 + \cos(4x) \cdot e^{-2x} \cdot -2$$
$$= -4e^{-2x} \sin 4x - 2e^{-2x} \cos 4x$$

(b). $y = 3^{x^3}$

$$y' = 3^{x^3} \cdot \ln 3 \cdot 3x^2$$

2. (1 pts) True or False: If $y = (\tan x)^x$, then $y' = x(\tan x)^{x-1}$

3. (3 pts) Solve the following equation for x .

$$3e^{2x-4} = 8$$

$$e^{2x-4} = \frac{8}{3}$$

$$\ln e^{2x-4} = \ln\left(\frac{8}{3}\right)$$

$$2x-4 = \ln\left(\frac{8}{3}\right)$$

$$2x = 4 + \ln\left(\frac{8}{3}\right)$$

$$x = \frac{4 + \ln\left(\frac{8}{3}\right)}{2}$$

4. (4 pts) Evaluate the following integral.

$$\int \frac{e^{5x}}{(1+e^{5x})^2} dx$$

$$u = 1 + e^{5x}$$

$$du = 5e^{5x} dx$$

$$\frac{1}{5} du = e^{5x} dx$$

$$= \frac{1}{5} \int \frac{1}{u^2} du$$

$$= \frac{1}{5} \int u^{-2} du$$

$$= \frac{1}{5} \frac{u^{-1}}{-1} + C = -\frac{1}{5} \cdot \frac{1}{u} + C = \frac{-1}{5(1+e^{5x})} + C$$