

Name: _____

Homework 3 | Math 256 | Cruz Godar

Due Wednesday of Week 4 at the start of class

Complete the following problems and submit them as a pdf to Canvas. 8 points are awarded for thoroughly attempting every problem, and I'll select three problems to grade on correctness for 4 points each. Enough work should be shown that there is no question about the mathematical process used to obtain your answers.

Section 3

In problems 1–3, find the indicated derivative.

1. $\frac{\partial}{\partial t} [2ty + \sin(t)] .$

2. $\frac{\partial}{\partial y} [\sin(xy^x)] .$

3. $\frac{\partial}{\partial x} [\sin(xy^x)] .$

4. Using the multivariable chain rule, find $\frac{df(x,y)}{dt}$, where $f(x,y) = 2x^2 + \sec(xy^2)$, $x(t) = t$, and $y(t) = 5t^2$.

In problems 5–7, find the indicated integral. Make sure to express the constant as a function of the correct variable.

5. $\int f(x,y) \, dx$ for $f(x,y) = 2x \cos(y-x)$.

6. $\int f(x,y) \, dy$ for f as in the previous problem.

7. $\int g(x,y) \, dy$ for $g(x,y) = e^{x^2}$.

In problems 8–14, solve the the given DE.

8. $2y + 1 + (2x + 1)y' = 0$, $y(1) = 1$.

9. $1 - \sin(t + y) + y'(-\sin(t + y)) = 0, y(0) = 0.$

10. $\sin(y)y' - te^t \cos(y) = 0.$

11. $y' = -\frac{yx^{y-1}}{x^y \log(x)}, y(2) = 1.$

12. $ty' + y + t^{-2} = 0, y(2) = 2.$

13. $(10t + t^2) - 2\sin(y)y' = 0, y(0) = 1.$

14.

$$\sec^2(x)\sec(y) + \left(\tan(x)\tan(y)\sec(y) + \frac{1}{y}\right)y' = 0.$$