10350 Tutorial Week 06 - Set 01 Name ______________________

Section ______________

1. A differentiable function $g(x)$ is such that

$$g(2) = -2, \qquad g'(2) = 3, \qquad g(3) = 10 \quad \text{and} \quad g'(3) = -4$$

1a. If $C(x) = [g(x)]^4$ find $C'(2) \stackrel{?}{=}$ ____________

1b. If $P(x) = x \cdot e^{g(x)}$ find $P'(3) \stackrel{?}{=}$ ____________

1c. If $Q(x) = \dfrac{3}{(g(x)+1)^4}$ find $Q'(2) \stackrel{?}{=}$ ____________

10350 Tutorial Week 06 - Set 02 Name ______________________

Section ______________

2. Assuming the limit $\lim_{x\to 0} \frac{\sin x}{x} = 1$, find the values of the following limits showing your steps VERY CLEARLY.

2a. $\lim_{x\to 0} \frac{\sin(5x)}{7x} =$

2b. $\lim_{x\to 0} \frac{\sin(2x)}{\sin(3x)} =$

2c. $\lim_{x\to 0} \frac{\tan(6x)}{\tan x} =$

2d. $\lim_{x\to 0} \frac{x^2}{\sin 5x} =$

10350 Tutorial Week 06 - Set 03 Name ______________________

Section ______________

3. Consider the function

$$f(x) = \begin{cases} \dfrac{\sin(x-1)}{(x-1)} + 2 & x \neq 1 \\ -1 & x = 1 \end{cases}$$

3a. Using limits describe the kind of discontinuity at $x = 1$.

3b. Is it possible to redefine $f(1)$ so that $f(x)$ is continuous for all x?

10350 Tutorial Week 06 - Set 04

Name ______________________

Section ______________

Find the derivatives of the following functions:

4. $f(x) = (2x^2 + \pi)^4$

5. $g(x) = e^{x^2+2x}$

6. $h(x) = x\cos(2x)$

7. $y = \dfrac{e^{2x}-1}{e^{2x}+1}$. Simplify the expression you get.