

Calculus I

Name: _____

Study Guide 10

Class: _____

Due Date: _____

Score: _____

No Work \Leftrightarrow No Points

Use Pencil Only \Leftrightarrow Be Neat & Organized

1. Find $f'(x)$ for

(a) (2 points) $f(x) = \sin x + \cos x$

(a) _____

(b) (2 points) $f(x) = \sin x \cos x$

(b) _____

(c) (2 points) $f(x) = 2x^2 + \tan x$

(c) _____

(d) (2 points) $f(x) = \cot x - \csc x$

(d) _____

(e) (2 points) $f(x) = x^2 \cdot \sec x$

(e) _____

2. If $f(3) = 2$ and $f'(3) = 4$, then find $g'(3)$ if

(a) (3 points) $g(x) = 3x^2 - 5xf(x)$

(a) _____

(b) (3 points) $g(x) = (3x^2 - 5x)f(x)$

(b) _____

(c) (3 points) $g(x) = \frac{2x + 1}{f(x)}$

(c) _____

(d) (3 points) $g(x) = \frac{x^3}{[f(x)]^2}$

(d) _____

3. Find $\frac{dy}{dx}$ for

(a) (3 points) $y = \sin(x^3)$

(a) _____

(b) (3 points) $y = 4 \cos^5(x^2)$

(b) _____

(c) (3 points) $y = \frac{1}{2} \tan(x^2)$

(c) _____

(d) (3 points) $y = \cos^3(\sin 2x)$

(d) _____

(e) (2 points) $y = \cot^2 x - \csc^2 x$

(e) _____

4. (3 points) Find $\frac{d^2}{dx^2} [f(x^2)]$.

4. _____

5. (4 points) Find the equation of the tangent line to the graph of $f(x) = 1 + x + \sin x$ at $x = 0$.

5. _____

6. (4 points) Find the equation of the normal line to the graph of $f(x) = \frac{\sin x}{1 + \cos x}$ at the point $(0, 0)$.

6. _____

7. (3 points) Derive a formula in simplest form for $\frac{d}{dx} [\sin^2 x]$.

7. _____