

Calculus I

Name: _____

Study Guide 8

Class: _____

Due Date: _____

Score: _____

No Work \Leftrightarrow No Points

Use Pencil Only \Leftrightarrow Be Neat & Organized

1. (3 points) Prove $\frac{d}{dx} [x^2] = 2x$.

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

3. (5 points) Prove $\frac{d}{dx} [\sqrt{x}] = \frac{1}{2\sqrt{x}}$.

4. (5 points) Find the equation of the tangent line to the graph of $f(x) = x^3 + x^2$ at $x = 1$.

4. _____

5. (5 points) Find the equation of the normal line to the graph of $f(x) = (x - 2)^2 + 3$ at $x = 3$.

5. _____

6. (5 points) Find the equation of the tangent line to the graph of $f(x) = \frac{x}{x-2}$ at the point $(4, 2)$.

6. _____

7. (5 points) Find $\frac{d}{dx} [f'(x)]$ for $f(x) = (x^2 + 4)(x + 2)(x - 2)$.

7. _____

8. (5 points) Use the quotient rule to find a formula for $\frac{d}{dx} \left[\frac{1}{f(x)} \right]$.

8. _____

9. (5 points) Use the product rule to find a formula for $\frac{d}{dx} [f(x)g(x)h(x)]$.

9. _____

10. Find $f'(x)$ for

(a) (2 points) $f(x) = \pi$

(a) _____

(b) (2 points) $f(x) = t^2 - 4t$

(b) _____

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

(c) _____

(d) (2 points) $f(x) = \tan^2 x - \sec^2 x$

(d) _____
