Calculus I	**Name:** _____
Study Guide 9	**Class:** _____
Due Date: _____	**Score:** _____

No Work ⇔ No Points

Use Pencil Only ⇔ Be Neat & Organized

---

1. Find $f'(x)$ for

   (a) (2 points) $f(x) = 4x^{11}$

   (a) _____

   (b) (2 points) $f(x) = \frac{1}{3}x^3 - \frac{1}{2}x^2$

   (b) _____

   (c) (2 points) $f(x) = mx + b$

   (c) _____

   (d) (2 points) $f(x) = ax^2 + bx + c$

   (d) _____

---

2. Find $\dfrac{dy}{dx}$ for

(a) (3 points) $y = x^{-4}$

(a) _____

(b) (3 points) $y = \sqrt{x} - \dfrac{1}{\sqrt{x}}$

(b) _____

(c) (3 points) $y = \sqrt[3]{x^2} + 1000x$

(c) _____

(d) (3 points) $y = (3x^2 + 5)(2x^3 - 3x)$

(d) _____

(e) (3 points) $y = (4x - 3)^2$

(e) _____

(f) (3 points) $y = \dfrac{2x-3}{x+5}$

(f) _____

(g) (3 points) $y = \dfrac{-1}{x^2-5x}$

(g) _____

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

3. _____

4. (4 points) Find the equation of the tangent line to the graph of $f(x) = \dfrac{x+1}{x-1}$ at $x = 0$.

4. _____

5. (4 points) Find the equation of the normal line to the graph of $f(x) = x^2 - 4$ at the point $x = -2$.

5. _____

6. (4 points) At which points on the graph of $f(x) = \dfrac{x}{x^2 + 9}$ have a horizontal tangent line?

6. _____

7. (5 points) Find the value of k such that the curve $y = x^2 + k$ is tangent to the line $y = 2x$.

7. _____