

WRITE YOUR NAME:

MAC 2233 Homework 3

Due in class, Friday February 9th

You can use more paper if necessary, but please STAPLE

Question 1. Differentiate the given function.

$$f(x) = \frac{x^7 - 8x^5}{x^3}$$

Question 2. Find the **equation** of the line that is tangent to the graph of the given function at the point where $x = 0$.

$$y = (x^2 + 5x + 4)(x^2 + 5x + 6)$$

Question 3. Differentiate the function and simplify your answer.

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

Question 4. Differentiate the function and simplify your answer.

$$f(x) = \frac{(x + 1)^3}{(x - 1)^8}$$

Question 5. Consider the function $f(x) = 6x^2 - x^3$.

(a) Find $f'(x)$ and $f''(x)$.

(b) Evaluate $f(x)$ and $f'(x)$ at $x = 0, 1, 2, 3, 4, 5,$ and 6 .

(c) Use the information from (b) to draw a graph of $f(x)$ on the interval $0 \leq x \leq 6$.

(d) What value of x do you think makes $f(x)$ the largest? What value of x do you think makes $f'(x)$ the largest? What does that say about the graph at those points?