

**WRITE YOUR NAME:**

MAC 2233 Homework 2

Due in class, Friday February 2nd

You can use more paper if necessary, but please STAPLE

**Question 1.** Consider the function  $f(x) = 3x^2$ .

- (a) If  $x$  changes from 10 to 10.1, how much does  $f(x)$  change by?
- (b) Let  $P$  be the point on the graph of  $f$  where  $x = 10$ , and let  $Q$  be the point on the graph of  $f$  where  $x = 10.1$ . What's the slope of the line joining  $P$  and  $Q$ ?
- (c) Let  $P$  be the point on the graph of  $f$  where  $x = 10$ , and let  $R$  be the point on the graph of  $f$  where  $x = 10 + h$ . What's the slope of the line joining  $P$  and  $R$ ?
- (d) What's the slope of the tangent line to the graph of  $f$  at the point  $P$ ?

**Question 2.** Find the derivative of the function.

$$f(x) = \frac{x^5}{5} + \frac{5}{x^5} + \frac{1}{5x^5} + \frac{x^{47} + x^{48}}{x^5}$$