

Name: \_\_\_\_\_

Quiz 4 (Version A)

**Instructions:** This quiz is closed book, closed note, and an individual effort. Electronic devices other than approved calculators are not allowed on your person (e.g., no cell phones or calculators with CAS). Answer each question. **Show all work to receive full credit.** Unless the question specifies, you may provide either an exact answer or round to two decimal places. If you get stuck, please attempt to explain what you want to do. This may give more partial credit. This quiz is out of 20 points.

1. (2 points each) Find  $f'(x)$  and  $f''(x)$  for each  $f(x)$ . **If you do not simplify completely, you will get no credit for the question**

(a)  $f(x) = \sin(1)$

(b)  $f(x) = 7x^5 - \frac{3}{2}x^4 + 2x^3 - \frac{5}{2}x^2 + 10x - \frac{9}{7}$

(c)  $f(x) = \pi^x$

(d)  $f(x) = \ln(x)$

(e)  $f(x) = 3e^x$

2. (3 points) Find the equation of the tangent line to the curve when  $x = 2$  and  $f(x) = x^4 - 3x^2 + 1$ .

3. (3 points) Let the total revenue of a company be modeled by the function  $R(q) = -\frac{3}{2}q^2 + 125q$ . Find  $R(620)$ . Then find  $R'(620)$  and interpret the meaning of this in dollars per units. **Show how you got each answer**

4. (4 points total) Let Johnny B. Goode invest \$200 in an account earning 4% compounded continuously for  $t$  years.

(a) (1 point) Find an function modeling the above with  $P$ , the amount in the account, with respect to  $t$ , time in years.

(b) (1 point) Use the above to find  $P(10)$ . **Show how you got your answer**

(c) (2 points) Use the function from (a) to find  $P'(10)$  and interpret the meaning.