

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. (3 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)  $f(x) = \frac{2\pi - e}{4\ln(3)}$

(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. (2 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 profit of a company be modeled by the function  $\pi(q) = -\frac{3}{2}q^2 + 125q$ . Find  $\pi(60)$ . Then find  $\pi'(60)$  and determine if they should produce and sell the 61st unit. **Show how you got each answer**