

Math 1203 Quiz 10

Day after April Fool's Day 2019

Name: _____

Instructions: No calculators. Use provided scrap. Write your fully simplified answers in the space provided.

- Use linear approximation or differentials to approximate $(27.1)^{1/3}$ by completing the following:
 - Define a function to use: $f(x) =$ _____
 - $x =$ _____, $a =$ _____
 - The general formula (in f) used to make the approximation _____
 - The approximate value is _____ (write as a fraction)
- A mythical bank pays 4% interest compounded continuously. Suppose you deposit \$5000 into an account with this bank. Let $P(t)$ be your account balance t years after your initial deposit.
 - Describe the growth of this account with a differential equation: _____
 - Find a formula for $P(t) =$ _____
 - How long will it take for your principal to reach \$7000? _____ years
 - At what rate (in \$/year) is your account increasing when the balance is \$7000? _____ \$/year
- Suppose $C(x) = 2x^2 + 3x$ is the cost to manufacture x units of a product.
 - Find the marginal cost (express as an equation): _____
 - What is the marginal cost when $x = 10$? _____
 - Interpret your answer to part (b) _____

Bonus (Complete the other problems to be eligible):

- Suppose $p = \frac{25}{\sqrt{x}}$ is the demand function for a product.
 - What is the revenue function for this product? $R(x) =$ _____
 - What is the marginal revenue for this product: _____ (equation!)
 - Suppose the cost to produce x units of this product is $C(x) = x^2 + 2x$, what is the marginal profit?
_____ (equation!)
 - Is it worth producing one more item after 100 have been produced? Answer "yes" or "no" and justify:
