MATH 422 Math for Business Applications **Spring 2023**

Weekly Quiz 4/27/23 **Name**_____

Directions: Please answer the following questions to the best of your ability. Provide reasoning when asked. Quizzes will all be 15 points each. A calculator is necessary for portions of the quiz.

1. (**3 points**) Select the statement that BEST describes what the derivative of a function measures:
   a. The derivative is a measure of equilibrium
   b. The derivative is a measure of the rate of change of y with respect to x
   c. The derivative is negative when something is increasing very slowly
   d. The derivative is positive whenever something is in motion

2. **(3 points)** Select the statement that is TRUE:
   a. When a function is increasing its derivative is positive
   b. The derivative always exists as long as the function exists
   c. The derivative is 0 at all maximum or minimum values
   d. If the y values of a function are all positive, its derivative is positive everywhere

3. **(3 points)** Select the answer that BEST describes "total cost" in a business setting:
   a. The total cost function is marginal cost + fixed cost
   b. The total cost function is the derivative of marginal cost
   c. The total cost function always decreases
   d. The total cost function is fixed cost + variable cost

4. **(3 points)** Given that $f(x) = y = \frac{90}{x^2+1}$ and $f'(x) = \frac{dy}{dx} = \frac{-180x}{(x^2+1)^2}$

   what is the slope of the graph of f(x) at x = 4 ?

   What is the y coordinate of the graph at x = 4 ?

5. **(3 points)** The total cost to produce "x" items is given by $C(x) = 52 + 12x$

   What is the fixed cost?

   What is the variable cost?

   What is the unit cost (cost per item)?

Formula for Unit Cost: $Unit(x) = \frac{Variable\ Cost}{x} = \frac{V(x)}{x} = V(x) \div x$