

YOUR NAME: \_\_\_\_\_

George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Compute the following derivatives:

(a)  $[5x^3 - 7x^2 + 2019x - 2018]' =$

- (b) (Use the product rule)

$$\left[ (x + 6\sqrt{x}) \left( x - \frac{5}{\sqrt[3]{x}} \right) \right]' =$$

2. Find an equation for the tangent line to the graph of

$$f(x) = \frac{8x + 1}{1 - x^2}$$

at the point  $x = -2$ .

3. Mireille has perfected a marvelous recipe for spiced oatmeal cookies. She has begun setting up booths at local U.P. fairs to promote her tasty products. She has calculated that each box of “Mireille’s Finger-Licking Oatmeal Marvels”<sup>®</sup> costs \$10 to make and that her fixed costs are \$400. She is rather rusty in her Math skills, since it has been a few years since she has taken George’s Math 112<sup>®</sup> (of which she has very fond memories), so she has asked you to help her in answering the following questions (assuming  $x$  is the number of boxes of cookies she will bake and sell):

- (a) Her cost function is

$$C(x) =$$

- (b) Her average cost function is

$$AC(x) =$$

- (c) Her marginal average cost function is:

$$MAC(x) =$$

- (d) Her marginal average cost for producing 20 boxes is \_\_\_\_\_.



“Hmmm... but what does this mean?”

Please, help her interpret this answer.