

YOUR NAME: _____

George Voutsadakis

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

1. [4 points] Compute the following derivatives using the product or quotient rules, as appropriate:

$$\left[(x^3 - x^5) \left(\frac{1}{\sqrt{x}} + \sqrt[3]{x} \right) \right]' =$$

$$\left[\frac{x^3 - 2x + 5}{7x^2 - 3x} \right]' =$$

2. [4 points] Find an equation for the tangent line to $f(x) = (2x^5 + 1)^3$ at $x = 1$. (Be careful! We cannot distribute the power!)

3. [4 points] Suppose a moving object is $s(t) = \frac{1}{12}t^4 + \frac{1}{6}t^3$ meters away from the origin at time t in seconds. When answering the questions below, please make sure to provide units.

(a) Find the velocity of the object at $t = 2$ seconds.

(b) Find the acceleration of the object at $t = 3$ seconds.