

Name: _____

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Circle one: Rhodes (F01) | Bueler (F02)

25 points possible. No aids (book, calculator, etc.) are permitted. Show all work for full credit.

1. [15 points] Compute the derivatives of the following functions. Write your answer using appropriate derivative notation, but you need not simplify your answers.

a. $f(x) = 3e^x - x^e + e^3$

b. $g(u) = u^{2/3} - u^{5/3}$

c. $r(x) = \frac{2}{x^3}$

d. $s(t) = e^t (\sqrt{t} - 1)$

e. $y = \frac{2x^2}{1 - 5x^3}$

2. [4 points] Suppose that $f(3) = 2$, $g(3) = 4$, $f'(3) = -1$, and $g'(3) = 3$. Find the following values.

a. $(fg)'(3)$

b. $\left(\frac{f}{g}\right)'(3)$

3. [3 points] Find an equation of the tangent line to the curve $y = 2x - x^2$ at $x = -1$.

4. [3 points] At what x value is the tangent line to the curve $y = e^x - 2x - 3$ parallel to $y = 3x - \frac{5}{2}$?