

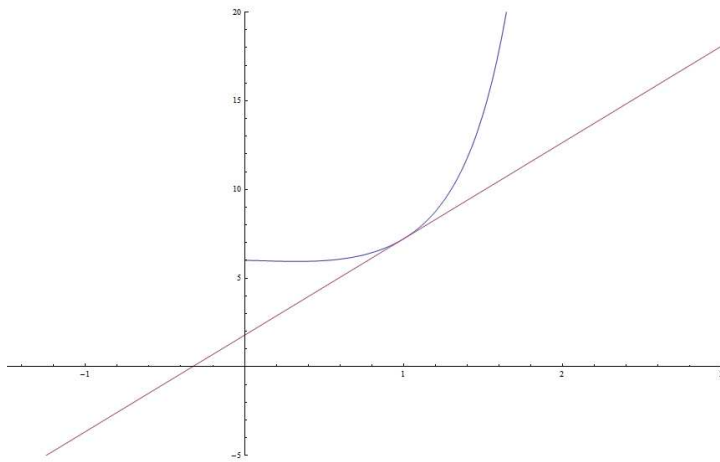
YOUR NAME: \_\_\_\_\_

George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Solve the logarithmic equation  $\log x + \log (x - 3) - \log (7x) = 3$ .

2. Find an equation for the tangent line to the graph of  $f(x) = x^2 \ln x - \frac{1}{2}x^2 + e^{x^2} + 5$  at  $x = 1$ .



3. Find the average value of the function  $f(x) = 6x^2 - 4e^{2x}$  in the interval  $[0, 1]$ .

4. Find the area of the region enclosed by the graphs of the functions  $f(x) = x^2 - 4x + 4$  and  $g(x) = -x^2 + 4$ .

5. Use substitution to find the integral  $\int \sqrt{3x^5 - 5x^3}(x^4 - x^2)dx$