EXAM 4 - MATH 112 Friday, April 14

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. Compute the following derivatives:

   (a) $[x^3 \ln(e^x - 2x)]' =$

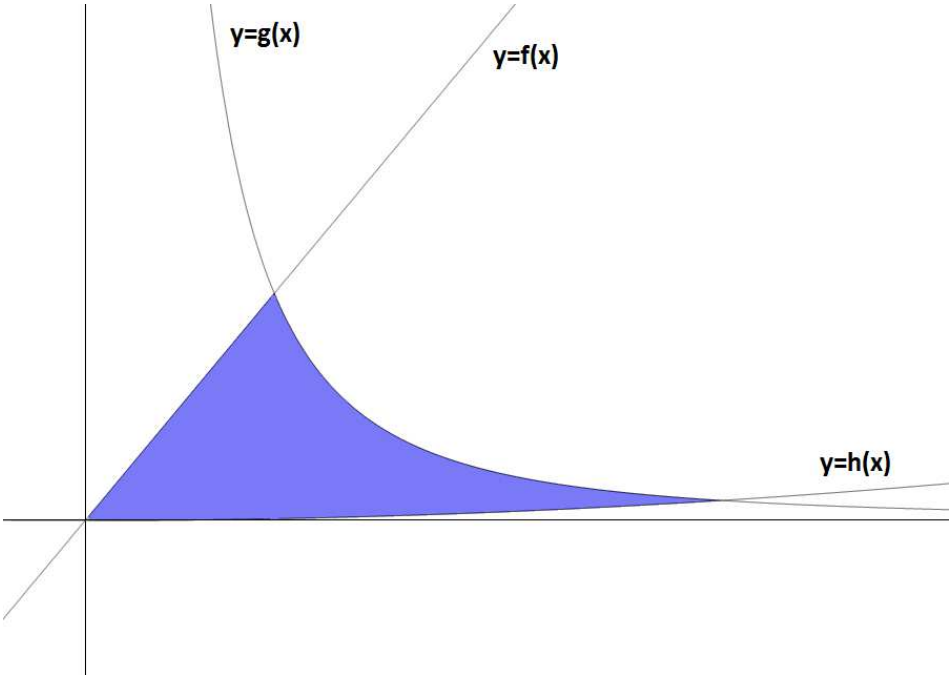
   (b) $\left[\frac{e^{x^3}}{x^2}\right]' =$

2. The rate of change of the cost for maintaining a home in dollars per year for a home that is t years old is $200e^{0.4t}$.

   (a) Find a formula for the total maintenance cost for the first t years.

   (b) If the home owner wants to sell the house when the total cost of maintenance reaches the level of \$2,500, how old should the house be when she sells?

3. Find the area of the shaded region in the following graph, where $f(x) = 8x$, $g(x) = \frac{1}{x^2}$ and $h(x) = \frac{1}{16}x^2$.



4. Find the integral $\int e^{x^4-4x^2+7}(x^3-2x)dx$.

5. Find the average value of the function $f(x) = 5x(x^2+1)^3$ from $x = 0$ to $x = 2$.