

Exam 1B

MATH 230, FALL 2015

Name:

Directions: Show ALL work for full credit. No calculators allowed.

1. Find the area of the region bounded between the curves $y = x^3$ and $y = 2x - x^2$.

2. Use the curves $y = 4 - x^2$, $x = 0$, and $y = 0$ and $x \geq 0$ to answer the following questions.
 - a) Graph the region bounded by these curves.

 - b) SET UP (do not evaluate) an integral representing the volume of the solid created when rotating the region about the given lines and using the given methods:
 - i) y -axis using disks/washers

 - ii) y -axis using cylindrical shells

 - iii) $y = -1$ using disks/washers

 - iv) $x = 2$ using cylindrical shells

3. Set up an integral that represents the length of the curve $y = xe^{-x}$ for $0 \leq x \leq 2$.
4. Find the exact area of the surface obtained by rotating the curve $y = \sqrt{x}$ between $4 \leq x \leq 9$ about the x -axis.
5. Find $(f^{-1})'(1)$ for $f(x) = 6x^3 + 2x + 1$ and describe what this value represents.
6. Use logarithmic differentiation to differentiate $y = (\cos(x))^x$.

7. Evaluate the integral.

a) $\int_1^e \frac{x^2 + x + 1}{x} dx$

b) $\int \frac{\sin(\ln(x))}{x} dx$

c) $\int e^x(4 + e^x)^5 dx$

Extra Credit Evaluate $\int \tan(x) dx$.