Math 181 Name _____
Fall, 2008

Exam 1
Part 1
No Calculator! No notes!

Evaluate each of the following integrals.

1. $\int x \ln\left(x^2+1\right) dx$

2. $\int e^{2x} \cos x dx$

3. $\int \arctan x dx$

4. $\int \frac{2x}{\sqrt{1-x^4}}\,dx$

5. $\int \frac{x+2\sqrt{x-1}}{2x\sqrt{x-1}}\,dx$

6. $\int \frac{2x^3}{x^2-1}dx$

7. $\int \frac{1}{1-\sin x}\,dx$

8. $\int x^4 e^{-x} dx$

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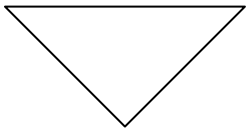
Exam 1
Part 2
Calculator Ok!
No work = no credit!

1. Find the volume of the solid generated by revolving the region in the first quadrant bounded by the coordinate axes, the curve $y = e^{-x}$, and the line x = 1 about the line x = 1.

2. A flat isosceles right triangular plate with base 6 foot and height 3 foot is submerged vertically base up, 2 feet below the surface of a swimming pool. Find the force exerted by the water against one side of the plate. The weight density of the water is 62.5 pounds per cubic foot.



3. Find the volume of the solid generated by revolving the region bounded by $y = 2x - x^2$ and y = x about

   a) the y-axis

   b) the line x = 1

4. A conical tank with radius 5 feet and height 10 feet is filled to within 2 feet of the top with olive oil weighing 57 pounds per cubic foot. How much work does it take to pump the oil to a level 4 feet about the top of the tank?

5. Find the area of the surface generated by revolving the curve $x = \sqrt{4y - y^2}$, $1 \le y \le 2$ about the y-axis.

6. Find the length of the curve $x = y^{\frac{2}{3}}$ from $1 \le y \le 8$.