# TEST 1

Math 152 - Calculus II **Score:** _____ out of 100

9/20/2013 **Name:** _____

**Read all of the following information before starting the exam:**

- You have 50 minutes to complete the exam.
- Show all work, clearly and in order, if you want to get full credit. Please make sure you read the directions for each problem. I reserve the right to take off points if I cannot see how you arrived at your answer (even if your final answer is correct).
- Please box/circle or otherwise indicate your final answers.
- Please keep your written answers brief; be clear and to the point. I will take points off for rambling and for incorrect or irrelevant statements.
- This test has 10 problems and is worth 100 points. It is your responsibility to make sure that you have all of the pages!
- Good luck!

1. Evaluate $\int \frac{e^x}{1-3e^x} dx$.

2. Evaluate $\int \sec^2(2x+1) dx$.

3. Suppose the average value of $f(x) = \sqrt{x}$ on $[0, b]$ is equal to 2. Find the value of $b$.

4. It takes 10 J of work to stretch a spring from its natural length to 0.5 m beyond its natural length. How much work is required to stretch the spring from 1 m beyond its natural length to 2 m beyond its natural length?

5. Find the area enclosed by the curves $y = \sqrt{x}$, $y = \dfrac{1}{1+x}$, $x = 4$ and $x = 9$.

6. Find the volume of the solid obtained by rotating the region bounded by $y = x + 1$, $y = 0$, $x = 0$ and $x = 1$ about the line $x = 3$ using **any method**.

7. **Set up but do not evaluate the integral** for the volume of the solid obtained by rotating the region bounded by $y = 2 - x^2$ and $y = 1$ about the line $y = -2$ **using the Washer/Disk Method**.

8. **Set up but do not evaluate the integral** for the volume of the solid obtained by rotating the region bounded by $y = 1/x$, $y = x-2$, $x = 1$ and $x = 2$ about the line $x = 5$ **using the (cylindrical) Shell Method**.

9. **Set up but do not evaluate the integral** for the length of the curve $y = e^{\sin(x)}$ from $x = 1995$ to $x = 2013$.

10. **Set up but do not evaluate the integral** for the surface area of the solid formed by rotating the portion of curve $y = \dfrac{\ln(x)}{2+x}$ from $x = 1776$ to $x = 2013$ about the $x$-axis.