Quiz 13 Calculus 1

Sections 4.8, 5.1, and 5.2 due April 21, 2015

This quiz is due on Tuesday, April 21, 2015 at the beginning of your drill. You may use your brain, notes, book, other humans and any pet of your choice. **Your solutions must be on a separate sheet of paper, in order, stapled, de-fringed, and legible with your name on the top right corner of the first page.** If you fail to meet any of these requirements you will receive a zero. Each question is one point.

Compute the following indefinite integrals:

1. $\displaystyle\int 3u^{-2} + u^{-1} - 4u^{1/3} + 1\, du$
2. $\displaystyle\int \sin(2y) + \sec^2(y)\, dy$
3. $\displaystyle\int \frac{1}{3x-2}\, dx$
4. $\displaystyle\int \frac{1}{z^2+4}\, dz.$

Find the solution to the following initial value problems:

5. $f'(x) = \dfrac{6}{\sqrt{25-x^2}},\ f(0) = 1$
6. $g'(x) = e^{5x+1},\ g(1) = 0.$

Assuming that $f(x)$ is a function such that $f(x) \geq 0$ on $[0,1]$, $f(x) \leq 0$ on $[1,3]$, $\displaystyle\int_0^1 f(x)\, dx = 4$, and $\displaystyle\int_1^3 f(x)\, dx = -2$, compute the following

7. $\displaystyle\int_0^3 |f(x)|\, dx$
8. $\displaystyle\int_0^3 (2f(x)+1)\, dx.$
9. Determine whether the following statement is true. If so, justify it; if not, explain why not.

   If f is a constant function on the interval $[a,b]$, then the right Riemann sum gives the exact value of $\displaystyle\int_a^b f(x)\, dx$ for any n.
10. (Using integrals to approximate particular numbers) Use the fact that $e^x \geq 1$ on $[0,1]$ and that $\displaystyle\int_0^1 (e^x - 1)\, dx = e - 2$ to show that $e \geq 2$.