Math 122 | Applied Calculus II
Spring 2011 | Quiz 5
Instructor: Shawn Rafalski | **Write your name on this quiz**

1. (2 points each) Compute the following definite integrals. It is not necessary to simplify the answers.

(a) $\int_{-1}^{2} (5x-3)\,dx = \left(\frac{5x^2}{2} - 3x\right)\Big|_{-1}^{2}$

$= \frac{5\cdot 4}{2} - 6 - \left(\frac{5}{2} + 3\right) = 1 - \frac{5}{2} = \boxed{-\frac{3}{2}}$

(b) (Hint: use substitution for this one) $\int_{4}^{6} \frac{2}{(2x-7)^2}\,dx = \frac{-1}{(2x-7)}\Big|_{4}^{6} = -\frac{1}{5} + 1 = \boxed{\frac{4}{5}}$

Subst: $u = 2x-7$

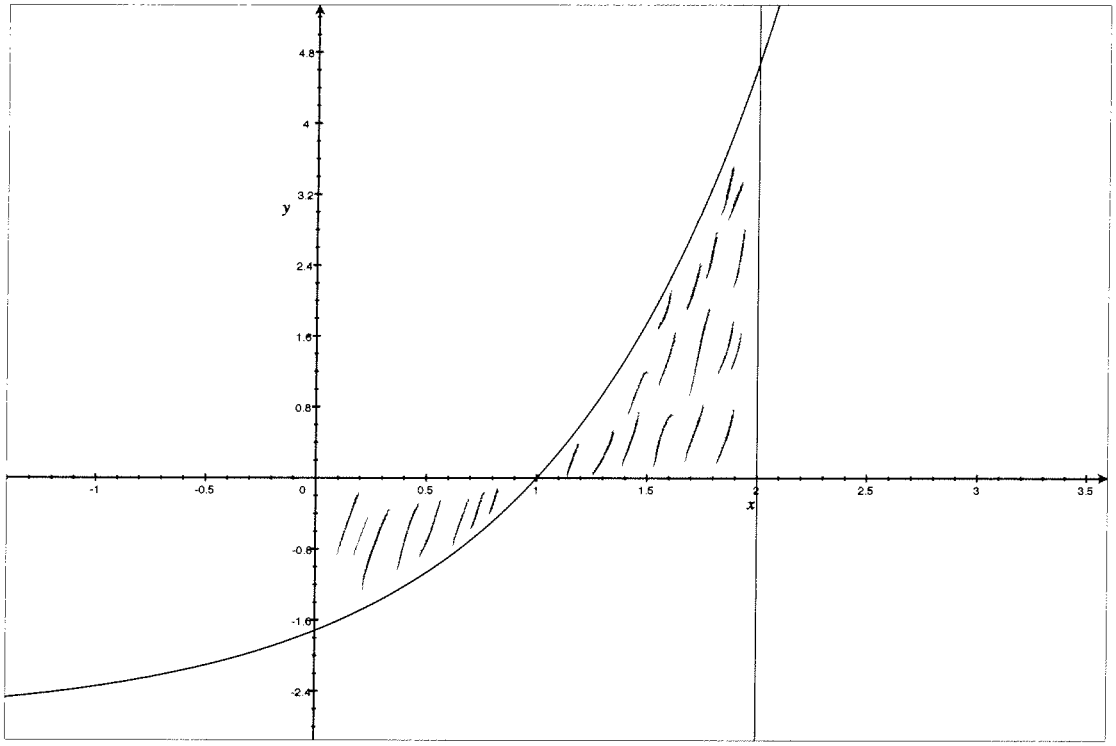
$du = 2dx$

$\int \frac{2}{(2x-7)^2}\,dx = \int u^{-2}\,du = \frac{u^{-1}}{-1} + C = \boxed{-(2x-7)^{-1} + C}$

(c) $\int_{1}^{4} \frac{1}{y}\,dy = \ln|y|\Big|_{1}^{4} = \ln|4| - \ln|1| = \boxed{\ln 4}$

(turn this page over)

2. (4 points) The figure below depicts part of the graph of the function $f(x) = e^x - e$. Using your pen or pencil, shade the area between the x–axis and the graph of $f(x)$ over the interval from $x = 0$ to $x = 2$. Then write an expression, using two *definite* integrals, that represents the area of the region you shaded. (You *do not* have to calculate the definite integrals, but you will get 2 BONUS points for doing so correctly.)



$$\left| \int_0^1 (e^x - e)\,dx \right| + \int_1^2 (e^x - e)\,dx$$