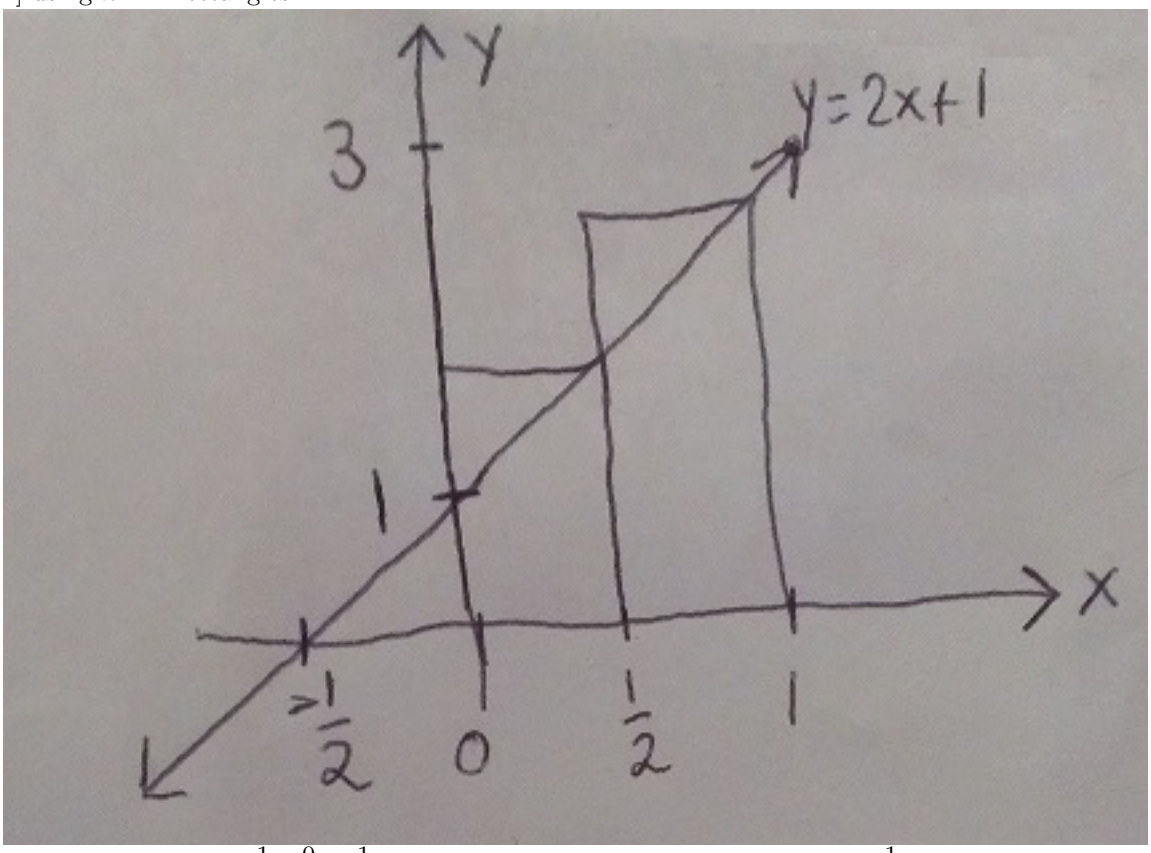
MATH 14 LAB SPRING 2014
Quiz 8 SOLUTIONS

Show all work clearly and in order, and circle your final answers.
Justify your answers algebraically whenever possible. Unjustified work may not receive full credit.
You have 25 minutes to complete this 10 point exam.

1. (*5 points*) Compute a Riemann sum estimation of the area under the curve $y = 2x + 1$ over the interval $[0, 1]$ using $n = 2$ rectangles.

Solution:



Call $f(x) = 2x + 1$. Using $\Delta_x = \dfrac{1-0}{2} = \dfrac{1}{2}$ and if we pick right endpoints we get $x_0^* = \dfrac{1}{2}$ and $x_1^* = 1$. So therefore our estimation is

$$\sum_{k=0}^{1} f(x_k^*)\Delta x = f(x_0^*)\frac{1}{2} + f(x_1^*)\frac{1}{2} = 1 + \frac{1}{2} = \frac{3}{2}.$$

2. (*5 points*) Consider the following limit of Riemann sums defined for a function over the interval $[0, 1]$:

$$\lim_{n\to\infty} \sum_{k=1}^{n} (\sin(x_k^*) + (x_k^*)^2 + 17)\Delta x.$$

What definite integral does it compute?

Solution: $\displaystyle\int_0^1 \sin(x) + x^2 + 17dx$