

# Math 157 - Quiz 11

November 25, 2015

Name key

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) Use a left sum over 5 subintervals to approximate  $\int_1^2 \frac{1}{x} dx$ . Then use your calculator to approximate the value of the integral.

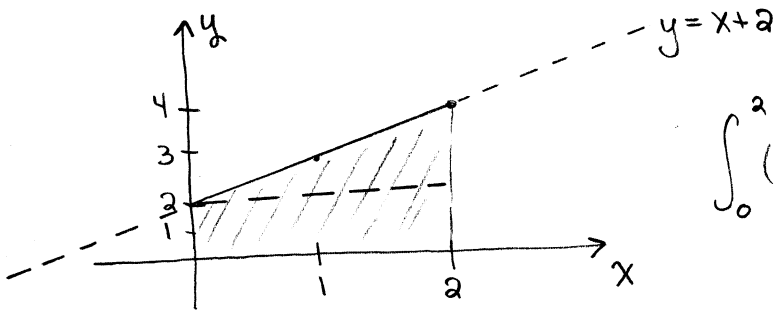
$$\Delta x = \frac{2-1}{5} = \frac{1}{5} \quad \text{PARTITION: } 1 < \frac{6}{5} < \frac{7}{5} < \frac{8}{5} < \frac{9}{5} < 2$$

\* \* \* \* \*

$$\text{LEFT SUM} = \frac{1}{5} \left( 1 + \frac{5}{6} + \frac{5}{7} + \frac{5}{8} + \frac{5}{9} \right) = \frac{1879}{2520} \approx 0.7456$$

$$\text{CALCULATOR: } \text{fnInt} \left( \frac{1}{x}, x, 1, 2 \right) \approx 0.693147$$

2. (3 points) Sketch the graph of  $y = x + 2$ . Then use area to evaluate  $\int_0^2 (x+2) dx$ .



$$\begin{aligned} \int_0^2 (x+2) dx &= \text{Area under graph on } [0, 2] \\ &= \Delta + \square = \frac{1}{2}(2)(2) + (2)(2) \\ &= \boxed{6} \end{aligned}$$

3. (4 points) Guess (and check) a function  $f$  whose derivative is  $f'(x) = 6x^2 + 2x + 1$ . Then use your function and the Fundamental Theorem of Calculus to evaluate

$$\int_1^3 (6x^2 + 2x + 1) dx.$$

$$f(x) = 2x^3 + x^2 + x$$

↓

$$\int_1^3 (6x^2 + 2x + 1) dx = (2x^3 + x^2 + x) \Big|_1^3$$

$$= 66 - 4 = \boxed{62}$$