

# Math 140, Section 5

## Quiz #11

April 6, 2001

### SOLUTIONS

1. Let  $f(x) = x + 1$ . Consider the interval  $[a, b]$  where  $a = 1$ ,  $b = 2$ . Form a Riemann sum with three intervals of equal length, with  $x_1, x_2, x_3$  being the right endpoints of the intervals. Evaluate the sum.

*Solution.*

$$x_1 = \frac{4}{3}, \quad x_2 = \frac{5}{3}, \quad x_3 = \frac{6}{3}, \quad \Delta x = \frac{1}{3}.$$

$$\begin{aligned} S &= \sum_{k=1}^3 f(x_k) \Delta x_k = f(x_1) \Delta x_1 + f(x_2) \Delta x_2 + f(x_3) \Delta x_3 \\ &= \frac{7}{3} \cdot \frac{1}{3} + \frac{8}{3} \cdot \frac{1}{3} + \frac{9}{3} \cdot \frac{1}{3} = \frac{24}{9} = \frac{8}{3}. \end{aligned}$$

2. Evaluate the definite integral  $\int_1^2 x + 1 \, dx$ .

*Solution.*

$$\int_1^2 x + 1 \, dx = \left. \frac{x^2}{2} + x \right|_1^2 = 4 - \frac{3}{2} = \frac{5}{2}.$$