

# Math 171 - Quiz 12

December 3, 2018

Name key

Score \_\_\_\_\_

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

1. (2 points) Partition  $[0, 2]$  into 5 subintervals and compute a Riemann sum associated with the following definite integral.

$$\Delta x = \frac{a}{5} = 0.4$$

$$\int_0^2 (x^2 - x + 1) dx$$

$$0 < 0.4 < 0.8 < 1.2 < 1.6 < 2$$

$$c_1 = 0.2$$

$$c_2 = 0.6$$

$$c_3 = 1.0$$

$$c_4 = 1.4$$

$$c_5 = 1.8$$

$$\sum_{k=1}^5 f(c_k) \Delta x = 0.4 (f(c_1) + f(c_2) + f(c_3) + f(c_4) + f(c_5))$$

$$= (0.4)(6.6)$$

$$= \boxed{2.64}$$

2. (2 points) Use the Fundamental Theorem of Calculus to find the exact value of the integral above.

$$\int_0^2 (x^2 - x + 1) dx = \left. \frac{1}{3}x^3 - \frac{1}{2}x^2 + x \right|_0^2$$

$$= \left( \frac{8}{3} - \frac{4}{2} + 2 \right) - 0 = \boxed{\frac{8}{3} \approx 2.67}$$

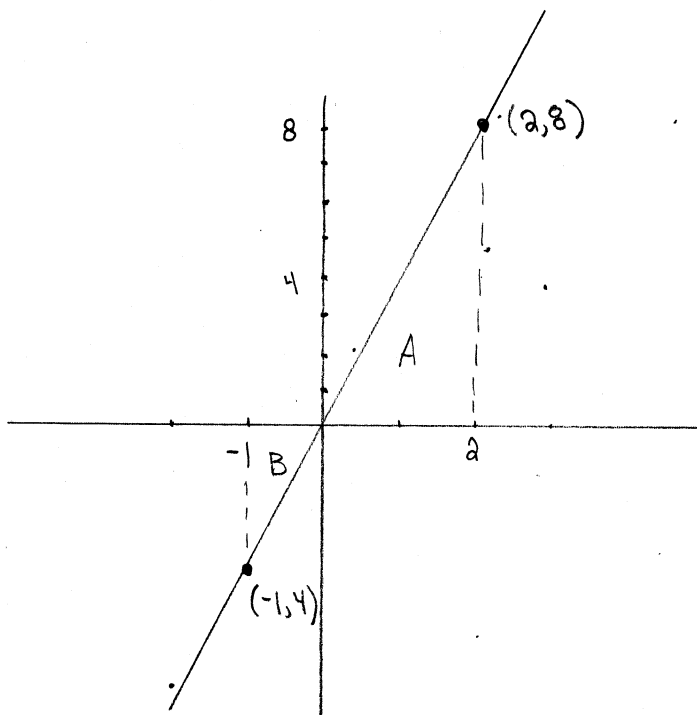
3. (2 points) Evaluate the following definite integral:  $\int_0^{\pi/2} (2 + 3 \sin x) dx$ .

$$\int_0^{\pi/2} (2 + 3 \sin x) dx = \left. 2x - 3 \cos x \right|_0^{\pi/2}$$

$$= \left[ 2\left(\frac{\pi}{2}\right) - 3(0) \right] - \left[ 0 - 3 \right]$$

$$= \boxed{\pi + 3}$$

4. (2 points) Use area to compute the value of the definite integral:  $\int_{-1}^2 4x \, dx$ .



Two  $\Delta$ 's, ONE COUNTS NEGATIVELY.

$$A - B$$

$$= \frac{1}{2}(a)(8) - \frac{1}{2}(1)(4)$$

$$= 8 - 2$$

$$= \boxed{6}$$

5. (2 points) Use the Fundamental Theorem of Calculus to find the value of the integral above.

$$\begin{aligned} \int_{-1}^2 4x \, dx &= 2x^2 \Big|_{-1}^2 \\ &= 8 - 2 = \boxed{6} \end{aligned}$$