

APPM 1360

Spring 2022

Quiz 2

02/01/2022

Time Limit: 10 Minutes

Name: \_\_\_\_\_

Recitation Section: \_\_\_\_\_

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$$T_n = \frac{\Delta x}{2} [f(x_0) + 2f(x_1) + \cdots + 2f(x_{n-1}) + f(x_n)], \quad \Delta x = \frac{b-a}{n}$$

$$M_n = \Delta x [f(\bar{x}_1) + \cdots + f(\bar{x}_n)], \quad \Delta x = \frac{b-a}{n}, \quad \bar{x}_i = \frac{x_{i-1} + x_i}{2}$$

1. (10 points) Let  $f(t) = e^{t^2}$ .

(a) Draw a graph of  $f(t)$  on the interval  $[0, 2]$ .

(b) On the same graph, draw the trapezoids corresponding to  $T_2$ , the trapezoidal rule approximation of  $\int_0^2 f(t)dt$ .

(c) Calculate  $T_2$ . Leave your answer in terms of powers of  $e$ .

(d) Is  $T_2$  an underestimate or overestimate of  $\int_0^2 f(t)dt$ ?