

Whose name goes here? Key

AP Calculus AB: 7.4 Riemann Sums Trapezoids

1. Write down the formulas for the approximation of the integral of the function $g(x)$ using the rules specified with 5 rectangles for the interval $[2,3]$.

Left-hand Rule

$$A = .2 [g(2) + g(2.2) + g(2.4) + g(2.6) + g(2.8)]$$

Right-hand Rule

$$b = \frac{3-2}{5} = .2$$

$$A = .2 [g(3) + g(2.8) + g(2.6) + g(2.4) + g(2.2)]$$

Midpoint

$$A = .2 [g(2.1) + g(2.3) + g(2.5) + g(2.7) + g(2.9)]$$

Trapezoid

$$A = \frac{.2}{2} [g(2) + 2g(2.2) + 2g(2.4) + 2g(2.6) + 2g(2.8) + g(3)]$$

2. Approximate the integral for the function $f(x) = e^{0.25x} + 1$ using the methods below for the interval $[2,4]$.

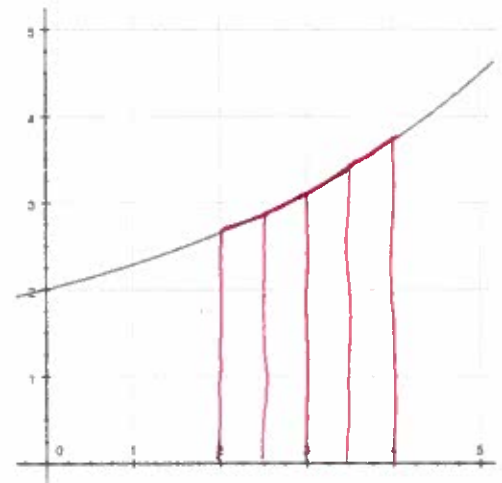
a) To the right draw the trapezoid rule for the interval $[2,4]$ using 4 trapezoids. $b = \frac{4-2}{4} = .5$

b) Using 4 rectangles and the midpoint rule (Ans: 6.275)

$$A = .5 [f(2.25) + f(2.75) + f(3.25) + f(3.75)] = \boxed{6.275}$$

c) Using 4 trapezoids and the trapezoid rule (Ans: 6.284)

$$A = \frac{.5}{2} [f(2) + 2f(2.5) + 2f(3) + 2f(3.5) + f(4)] = \boxed{6.284}$$



3. Using the trapezoid rule estimate the integral of the table

x	2	4	6	8	10	12	14
f(x)	13	23	45	31	20	13	9

a) using 4 trapezoids of equal bases for the interval $[2,10]$ (Ans: 231)

$$B = \frac{10-2}{4} = \frac{8}{4} = 2$$

$$A = \frac{2}{2} [f(2) + 2f(4) + 2f(6) + 2f(8) + f(10)] = \boxed{231}$$

b) Using 3 trapezoids of equal bases for the interval $[2,14]$ (Ans: 304)

$$B = \frac{14-2}{3} = \frac{12}{3} = 4$$

$$A = \frac{4}{2} [f(2) + 2f(6) + 2f(10) + f(14)] = \boxed{304}$$