Integral Approximations

Assume that f(x) is continuous over [a, b]. If the number of subintervals between a and b is n,

then

 $\Delta x = \frac{a-b}{n}.$ If m_i is the midpoint of each subinterval,

Then

 $M_n = \sum_{i=1}^n f(m_i) \Delta x.$

Then

 $\lim_{n\to\infty} M_n = \int_a^b f(x) dx.$

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then
$$\Delta x = \frac{a-b}{n}$$
.

Using endpoints at
$$P = \{x_0, x_1, \dots, x_n\},\$$

set
$$T_n = \frac{\Delta x}{2} [f(x_0) + 2f(x_1) + 2f(x_2) + \dots + 2f(x_{n-1}) + f(x_n)].$$

More handouts like this are available at: uvu.edu/mathlab

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