

## Definite Integral

p. 354 - 364 (5.2)

# 58

All Riemann Sums will tend to the same limit if the partitions get closer to 0. Therefore, we can simplify the Riemann Sum notation to a definite integral notation described below.

Let  $f$  be continuous on  $[a, b]$ , and let  $[a, b]$  be partitioned into  $n$  subintervals of equal length  $\Delta x = \frac{b - a}{n}$ . Then the definite integral

of  $f$  over  $[a, b]$  is given by  $\lim_{n \rightarrow \infty} \sum_{k=1}^n (f(c_k) \Delta x) = \int_a^b (f(x)) dx$

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\*\*calc.(FR) 2. In the table below,  $v(t)$  represents the velocity, in ft/sec, of a car traveling on a straight road.

<b>t (sec)</b>	0	5	10	15	20	25	30	35	40	45	50
<b>v(t) ft/sec</b>	0	12	20	30	55	70	78	81	75	60	72

a) Approximate  $\int_0^{50} (v(t)) dt$  with a Riemann sum, using the midpoints of five subintervals of equal length.

b) Using correct units, explain the meaning of this integral.