- The Total change of a function is the integral of the rate of change of the function.

$$f(b) - f(a) = \int_a^b f'(x)\,dx \quad \text{(See Prb. 5)}$$

Most common application is to $s(t)$ = position, $s'(t) = v(t)$, the velocity

The total change in position is called the displacement.

$$\text{Displacement} = s(b) - s(a) = \int_a^b v(t)\,dt$$

The displacement is the integral of the velocity.

- The distance traveled is the integral of the speed.

$$\text{Distance traveled} = \int_a^b |v(t)|\,dt$$

(Odometer measures distance traveled)

Speed = absolute value of velocity (= magnitude of the velocity vector in Calc III)