$s'(1.5) = 0.499$

Because velocity is positive @ 1.5 sec., the particle is moving up.

$s(t) = -\frac{1}{2}\cos t + \frac{5}{2}$

$s'(t) = \frac{1}{2}\sin t$

$s''(t) = \frac{1}{2}\cos t$

$s''(1.5) = 0.0354$

The particle is speeding up because the velocity & acceleration have the same sign.

(c) $\int_0^2 s'(t)\,dt$

$\int_0^2 \frac{1}{2}\sin t\,dt = \frac{1}{2}\cos t \Big|_0^2$

$= -\frac{1}{2}\cos(2) - \left(-\frac{1}{2}\cos 0\right)$

$= -\frac{1}{2}\cos(2) + \frac{1}{2}$

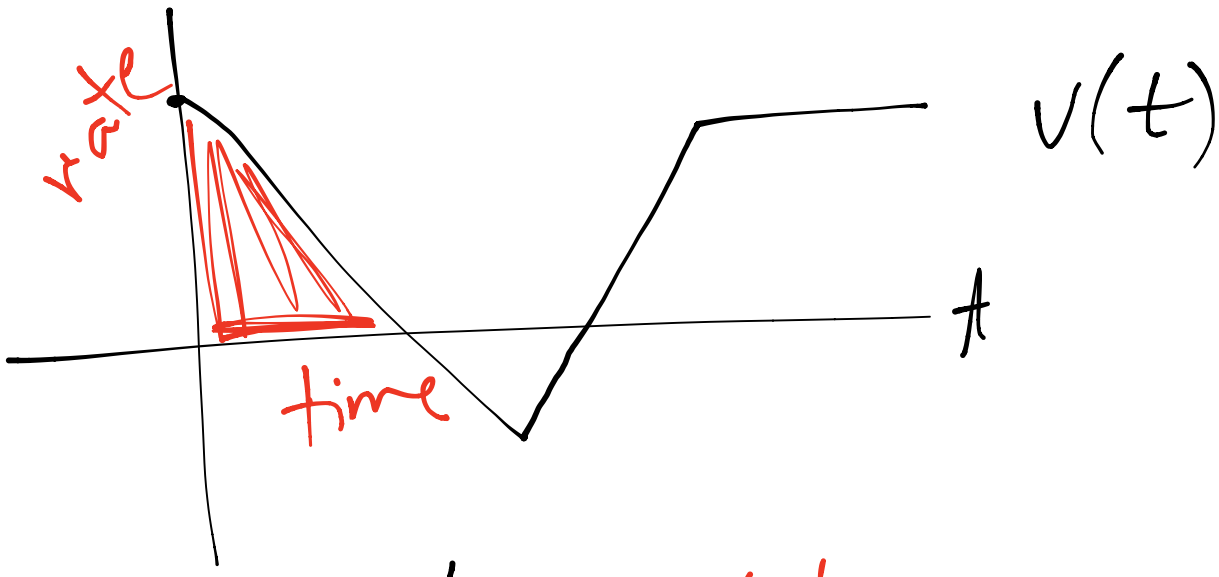
$= 0.70807$

$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

$s(0) = 2$

$s(2) = 2.70807$

0.70807 displacement



position ↑ int.

velocity

↓ deriv

↓ acceleration