

2024 AB #2
(calculator-active)

(a)

Using the calculator by graphing $v(t)$ on $0 < t < 2$ to solve $v(t_R) = 0$, $t_R = 1.4256097$

or 1.425 or 1.426

For $0 < t < t_R$, the particle is moving to the **right** because $v(t) > 0$ on this interval.

(b)

 $a(1.5) = v'(1.5) = -0.9999999$ or -1 $v(1.5) = -0.076856 < 0$ (note: only the sign of $v(1.5)$ is needed)The speed of particle is **increasing** at $t = 1.5$ because the signs of $a(1.5)$ and $v(1.5)$ are the same.Note: An alternate method: Since speed of the particle is $|v(t)|$,then the speed at $t = 1.5$ is increasing because $\frac{d}{dt}|v(t)|$ at $t = 1.5 > 0$.

(c)

 $x(4) = x(1) + \int_1^4 v(t) dt = -3 + \int_1^4 v(t) dt = -2.8028$ or -2.802 or -2.803

(d)

The total distance traveled on $1 \leq t \leq 4$ is $\int_1^4 |v(t)| dt = 0.958145$ or 0.958