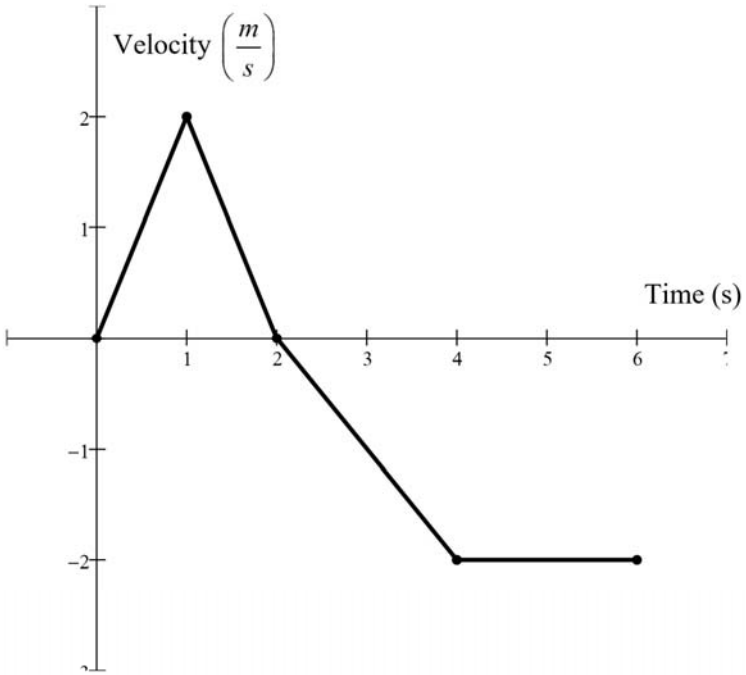
Particle Man

Wednesday, March 1, 2017 7:06 AM

Particle Man is moving along a number line. He starts at the origin, and his velocity is shown below:



Let s(t) = position, v(t) = velocity, a(t) = acceleration

1) s(2) = $s(0) + \int_0^2 v(t)\,dt$

$0 + \frac{1}{2}(2)(2) = \boxed{2}$

v(2) = 0

a(2) = undefined

a(3) = −1

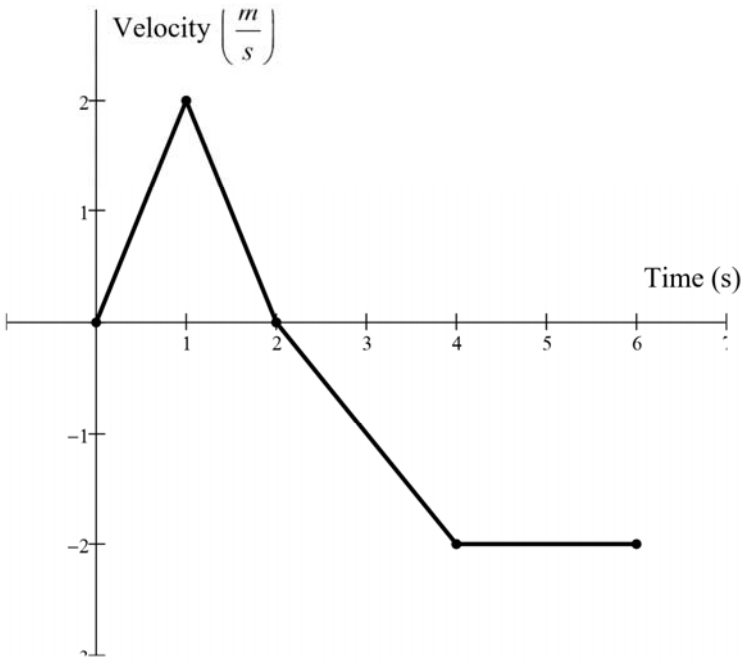
$s(0) = -4$

2) Which answer(s) above change if his starting position is moved from the origin to x = -4?

$s(2) = s(0) + \int_0^2 v(t)\,dt$

$= -4 + 2$

$= \boxed{-2}$



3) When is he…

a) Moving to the right? $v(t) > 0$ Left? $v(t) < 0$

$(0, 2)$ $(2, 6]$

b) Speeding up? $v(t), a(t)$ have same sign Slowing down? $v(t)(a(t)$ opp signs

$(0,1)$ $(2,4)$ $(1, 2)$

4) Does he end up to the **right** or **left** of his starting point? left

$$\text{disp} = \int_0^6 v(t)\,dt = 2 - 2 - 4 = -4$$