Assignments for the Week of Sept 19:

- Read 2.3-2.4
- 45 minutes of Khan Academy
- Due Wed. 21 Sept:
  2.3 #1-53 odd; 63-85 odd; 91-105 odd; 111-115 odd

Upcoming:

- 2.4 #7-33 odd; 43-89 odd Chain rule
- 5.1 Logarithmic functions
- 5.4 Exponential functions
- 5.5 Log and exp functions with other bases
- 5.8 Inverse trig functions

Instantaneous rate of change of a function $f(x)$ when $x = c$ is $f'(c)$ <-- slope of tangent line through a single point

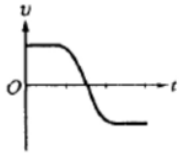
Average rate of change of a function $f(x)$ on the interval $[a, b]$ is $\frac{f(b)-f(a)}{b-a}$ <-- slope of secant line through two points

Given a position function $s(t) = gt^2 + v_0t + s_0$,

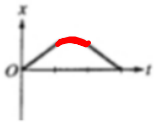
Since velocity is the rate of change of position,

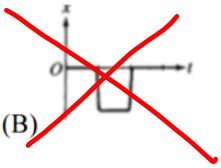
The instantaneous velocity at time $t = c$ is $s'(c)$

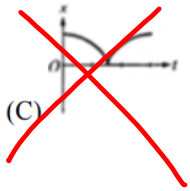
The average velocity on the interval $[a, b]$ is $\frac{s(b)-s(a)}{b-a}$

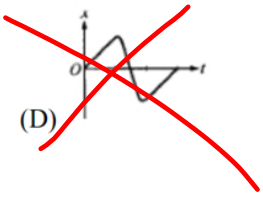


The graph above shows velocity v versus time t for an object in linear motion. Which of the following is a possible graph of position x versus time t for this object?

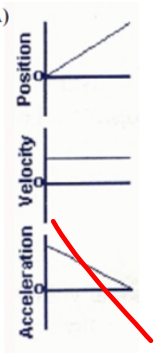
(A) 

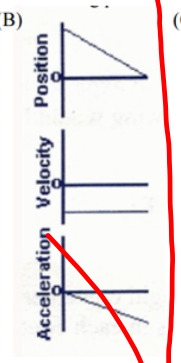
(B) 

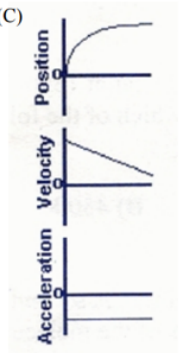
(C) 

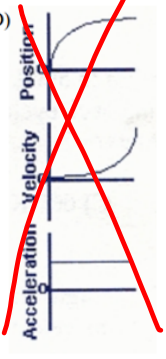
(D) 

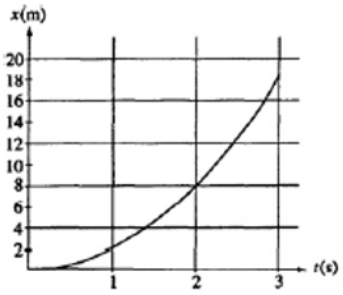
Which of the following sets of graphs below might be the corresponding graphs of position, velocity, and acceleration vs time for a moving particle?

(A) 

(B) 

(C) 

(D) 



$$\frac{\Delta x}{\Delta t} = \frac{x(2)-x(1)}{2-1} = \frac{8-2}{1} = 6$$

The graph above represents position x versus time t for an object being acted on by a constant force. The average speed during the interval between 1 s and 2 s is most nearly

(A) 2 m/s *(B) 4 m/s* *(C) 5 m/s* *(D) 6 m/s*

speed = |velocity|

Consider the motion of an object given by the position vs. time graph shown below. For what time(s) is the speed of the object greatest?

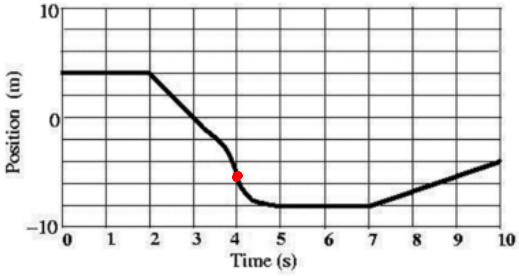
(A) At all times from t = 0.0 s → t = 2.0 s

(B) At time t = 3.0 s

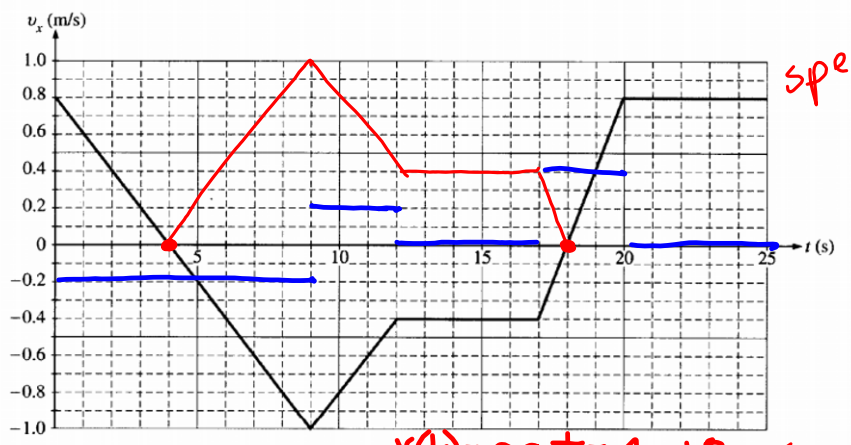
(C) At time t = 4.0 s

(D) At all times from t = 5.0 s → t = 7.0 s

(E) At time t = 8.5 s



2000B1 (modified) A 0.50 kg cart moves on a straight horizontal track. The graph of velocity v versus time t for the cart is given below.



speed = $|v(t)|$

a. Indicate every time t for which the cart is at rest. $v(t)=0$ at $t=4, 18$

b. Indicate every time interval for which the speed (magnitude of velocity) of the cart is increasing. $(4,9) \cup (18,20)$

c. ~~Determine the horizontal position x of the cart at t = 9.0 s if the cart is located at x = 2.0 m at t = 0.~~

d. On the axes below, sketch the acceleration a versus time t graph for the motion of the cart from t = 0 to t = 25 s.