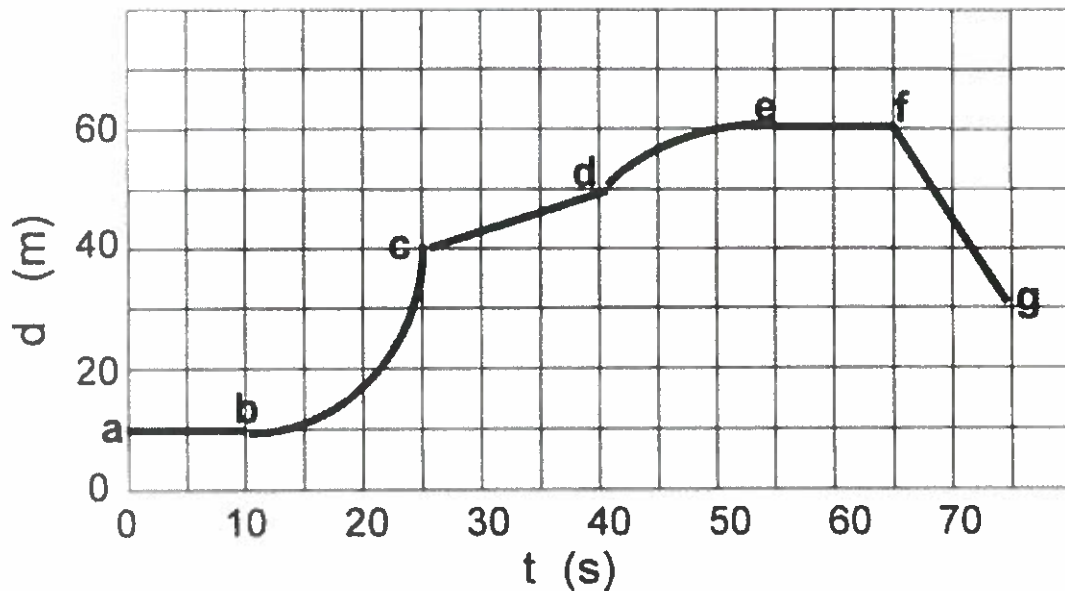


Who's ready to ace their Physics exam?! Key

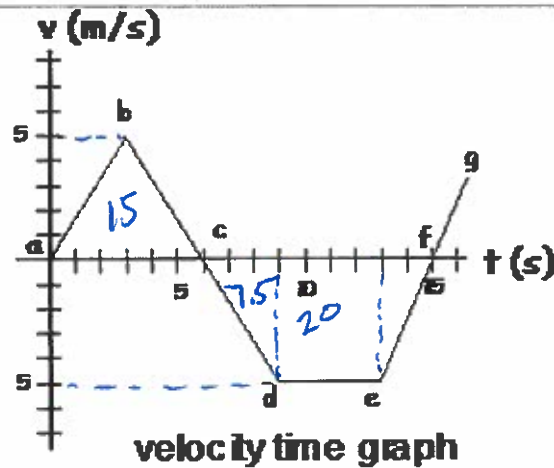
AP Physics Review

Refer to the graph of a cart's motion to answer the questions below:



- 1) In which section(s) is the cart accelerating? Justify.
 $[10, 25]$ because the slope of the d-t graph is increasing
- 2) In which section(s) is the cart decelerating? Justify.
 $[40, 50]$ because the slope of the d-t graph is decreasing
- 3) In which section(s) is the cart not moving? Justify.
 $[0, 10]$ & $[55, 65]$ because the slope of the d-t graph is zero
- 4) In which section(s) is the cart moving backwards? Justify.
 $[65, 75]$ because the slope of the d-t graph is negative
- 5) When does the cart have a constant velocity? Justify.
 $[25, 40]$ & $[65, 75]$ because the slope of the d-t graph is non-changing
- 6) What is the average velocity of the cart in the following sections?
a-b 0 m/s c-d $\frac{10}{15} = \frac{2}{3} \text{ m/s}$ b-c $\frac{30}{15} = 2 \text{ m/s}$ d-g $\frac{-20}{35} = -\frac{4}{7} \text{ m/s}$
- 7) How far does the cart move in the following sections?
b-c 30 m e-f 0 m f-g -30 m
- 8) At what time does the cart have the fastest speed? Justify.
point C. This is where the d-t graph has the largest slope.

Refer to the graph of a cart's motion to answer the questions below:



1) In which section(s) is the cart at rest? Justify.

a, c, & f because $v=0$

2) In which section(s) is the cart's ~~velocity~~ ^{speed} increasing? Justify.

$[0,3]$ $[6,9]$ $[15,16]$ because the velocity is getting away from zero.

3) In which section(s) is the cart slowing down? Justify.

$[3,6]$ $[13,15]$ because the velocity is approaching zero.

4) At which point(s) is the cart changing positions? Justify.

$t=6, 15$ because the velocity is changing signs.

5) What is the cart's displacement for the following intervals?

a-c $\frac{6(5)}{2} = 15\text{m}$ c-f $\frac{(9+4)(-5)}{2} = -32.5\text{m}$ a-f -17.5m

6) What is the cart's acceleration for the following intervals?

a-b $\frac{5}{3} \text{ m/s}^2$ b-d $-\frac{10}{9} \text{ m/s}^2$ d-e 0 m/s^2

~~7) Calculate at what point the cart returns to its original position.~~

8) Explain why the slope of this graph calculates acceleration.

$$\frac{\text{rise}}{\text{run}} = \frac{\text{m/s}}{\text{s}} = \frac{\frac{\text{m}}{\text{s}}}{\text{s}} = \frac{\text{m}}{\text{s}^2}$$

9) Explain why the area of this graph calculates distances.

~~10000~~
$$b \cdot h = \text{s} \cdot \frac{\text{m}}{\text{s}} = \text{m}$$