Motion Graph #3 - The following graph indicates the motion of an object along an East-West path.

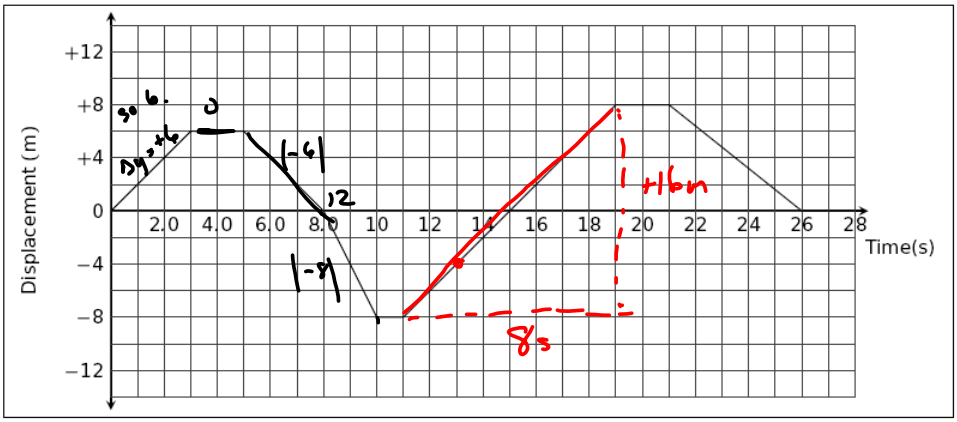
1. Was the object ever stopped? If so, when? 1. 3-5, 10-11, 19-21s (26-28s)
2. What was the total distance travelled in 8.0 s? 2. 6+6 = 12m
3. What was the total displacement after 8.0 s? 3. ☺ m
4. What was the speed at the 2.0 s point? 4. $2\frac{m}{s}$
5. What was the speed at the 6.0 s point? 5. $2\frac{m}{s}$

instantaneous

slope = $\frac{+6m}{3s} = +2\frac{m}{s}$

slope = $\frac{-6m}{3s} = -2\frac{m}{s}$

Motion Graph #3 - The following graph indicates the motion of an object along an East-West path.



6. What was the velocity at 2.0 s? 6. +2 m/s
7. What was the velocity at 6.0 s? 7. -2 m/s
8. What was the velocity at 13 s? 8. +2 m/s
9. When did the object return to the starting point? 9. 8.0, 15, 26 s
10. What was the average speed in the first 8.0 s? 10. 1.5 m/s

slope = +16m / 8s =

$\vec{d} = 0$

$v_{av} = \frac{d}{t} = \frac{12m}{8.0s}$

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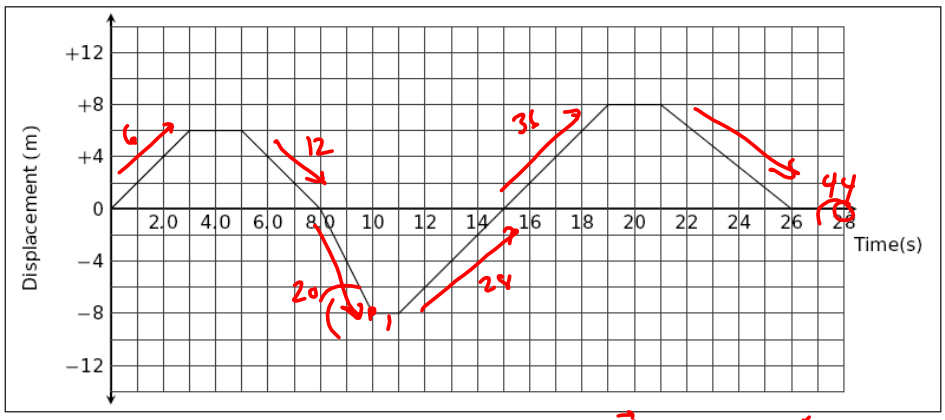


11. What was the average velocity in the first 8.0 s? $\vec{v}_{ave} = \frac{\vec{d}}{t} = 0$ 11. ☺ m/s

12. What was the total distance travelled by the object? 12. 44m

13. What was the object's total displacement? 13. ☺ m

14. What was the average velocity for the first 10 s? $\vec{v}_{ave} = \frac{\vec{d}}{t} = \frac{-8m}{10s}$ 14. −0.8 m/s

15. What was the average speed for the first 10 s? $v_{ave} = \frac{d}{t} = \frac{20m}{10s}$ 15. 2 m/s

	$\vec{d}$-t	$\vec{v}$-t
t	x-axis	
$\vec{d}$	y-axis	
d	$\Sigma \lvert \Delta y\text{-axis} \rvert$	
$\vec{v}$	slope	
v	$\lvert \text{slope} \rvert$	
$\vec{v}_{ave}$	$\vec{d}/t$	
v_{ave}	d/t	
$\vec{a}$		
$\vec{a}_{ave}$	$\frac{\Delta \vec{v}}{t}$	

capital sigma → Σ sum all of

capital delta → Δ change (final - initial)

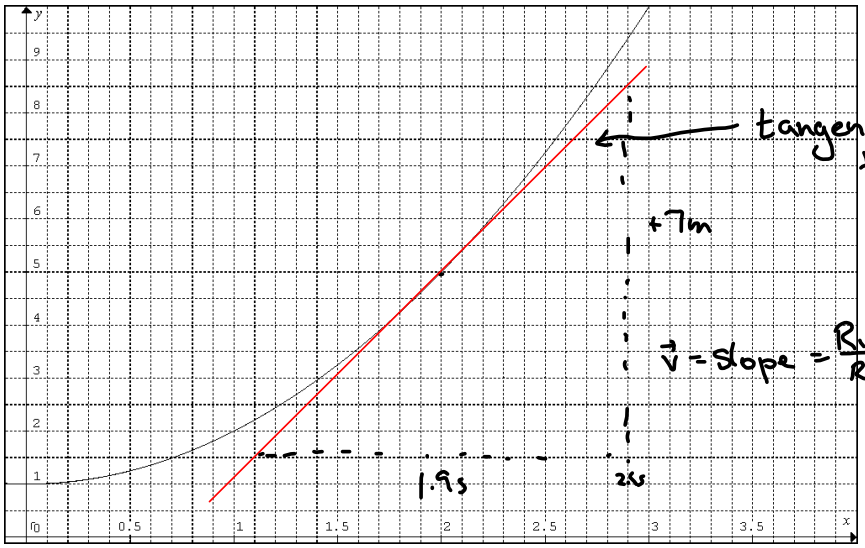
$|x|$ ← absolute value = size. (ignore the sign)

$$d = \Sigma \lvert \Delta y\text{-axis} \rvert$$

distance = sum of the changes in the y-axis, ignoring the signs

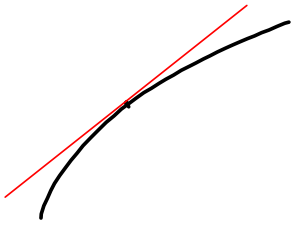
How do we find velocity if the graph is curved?

$\vec{v}$ at 2s.

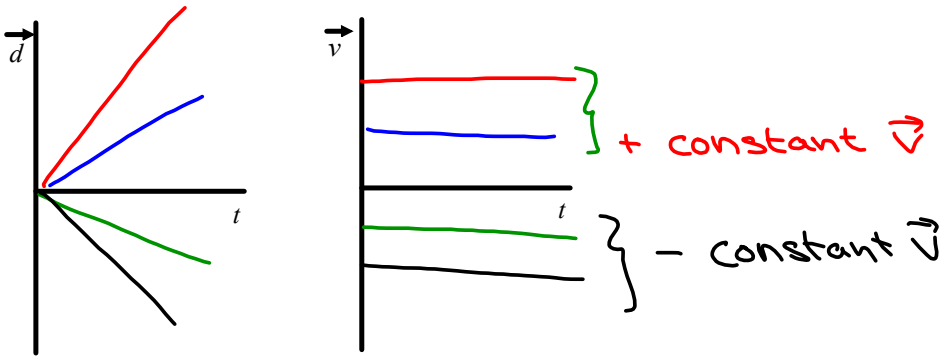


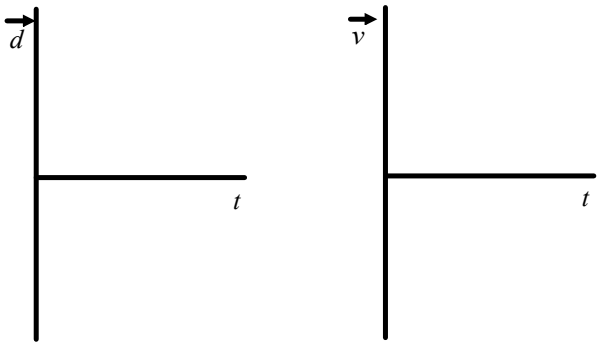
$\vec{v}$ = slope = $\frac{Rise}{Run} = \frac{+7m}{1.9s} = +3.7\frac{m}{s}$

1. Δ line
2. It has to look approximately tangent
3. Calculate the slope of that line correctly



$\vec{d} - t$ graphs applied to $\vec{v} - t$ graphs




d
t
v
t

For Homework: Graph #4