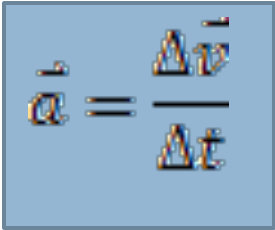


UNIT #1 MOTION

Acceleration

Acceleration

- acceleration = how quickly an object's velocity changes over time
-  = the rate of change of velocity

ex: What is the average acceleration of a person who increases his ~~velocity~~^{speed} from 0 to 25m/s in 10s?

a - no direction
(scalar)

\vec{a} - direction
(vector)

$$\vec{a} = \frac{\Delta \vec{v}}{\Delta t}$$

$$a = \frac{\Delta v}{\Delta t}$$

Given: $\Delta t = 10 \text{ s}$
 $v_i = 0 \text{ m/s}$
 $v_f = 25 \text{ m/s}$

Unknown: acceleration = a

Steps: $a = \frac{\Delta v}{\Delta t}$

$$= \frac{v_f - v_i}{\Delta t}$$

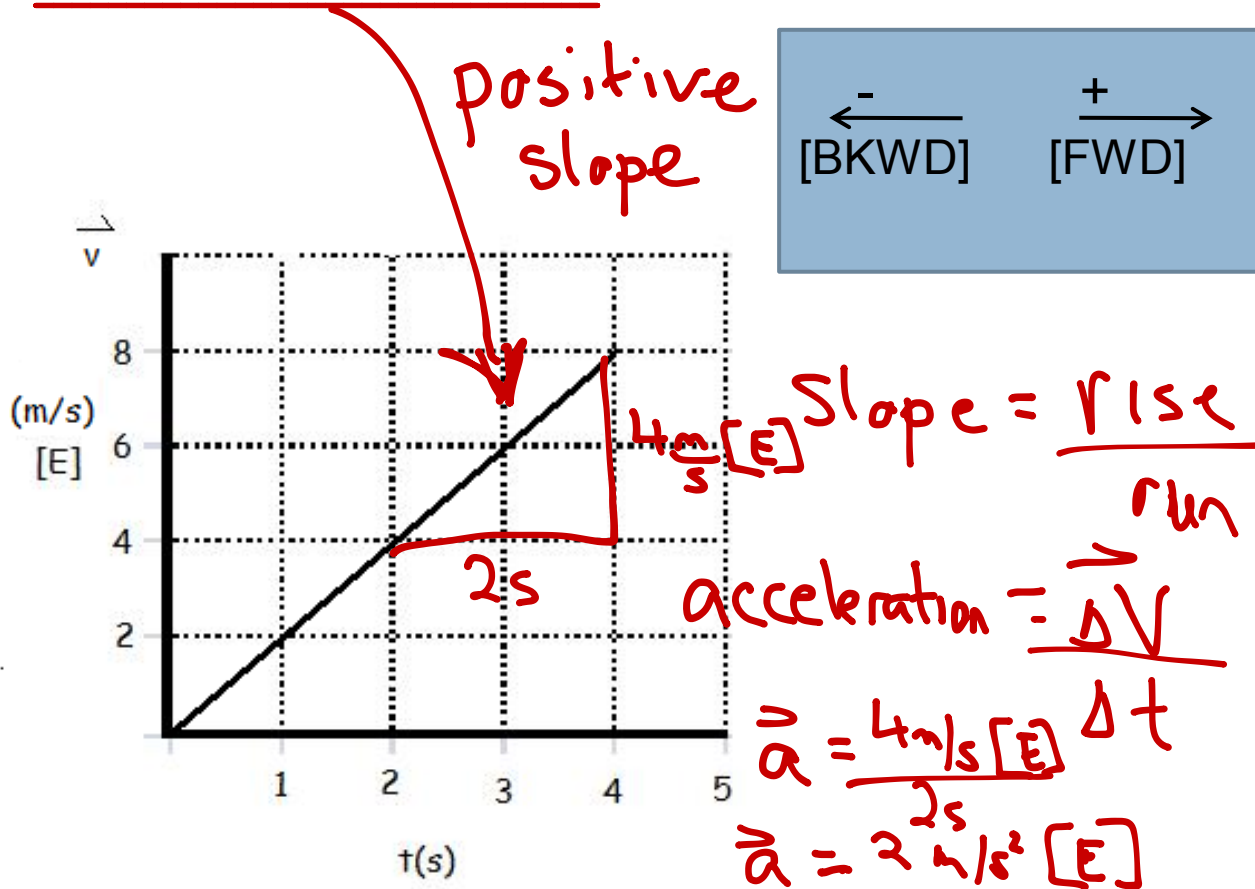
$$= \frac{25 \text{ m/s} - 0 \text{ m/s}}{10 \text{ s}}$$

$$= \frac{25 \text{ m/s}}{10 \text{ s}}$$

$$a = 2.5 \text{ m/s}^2$$

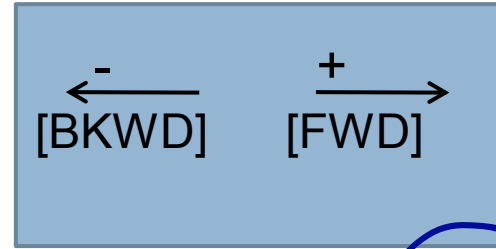
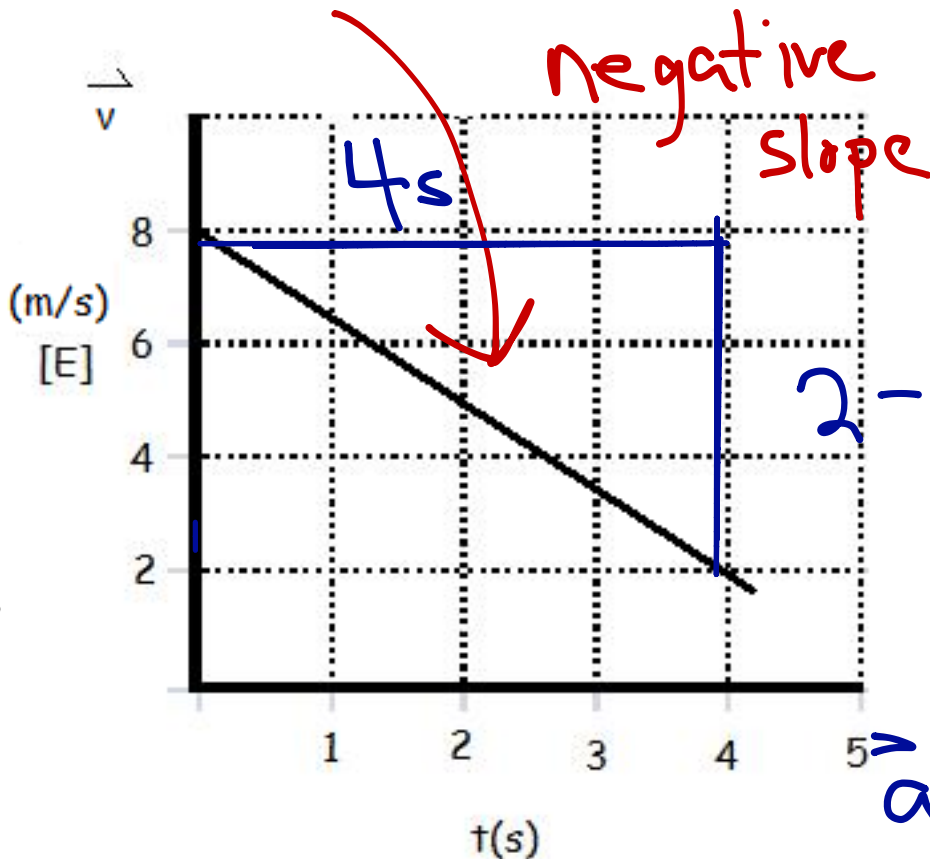
Velocity-Time Graphs

The velocity time graph of an object that is speeding up.



Velocity-Time Graphs

The velocity time graph of an object that is slowing down



$$a = -1.5 \frac{\text{m}}{\text{s}^2} [\text{W}]$$

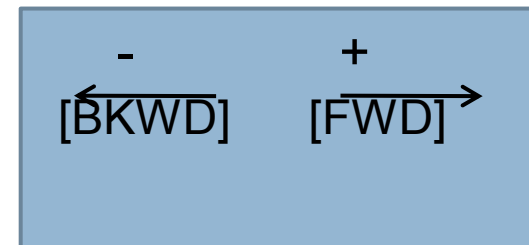
$$2 - 8 = -6 \frac{\text{m}}{\text{s}} [\text{E}] \quad \text{OR}$$

$$\vec{a} = -6 \frac{\text{m}}{\text{s}} [\text{E}]$$

$$\vec{a} = -1.5 \frac{\text{m}}{\text{s}^2} [\text{E}]$$

Velocity-Time Graph

The velocity time graph of an object that is moving at constant speed.



Classwork / HW

- Pg. 22 # 3 - 8