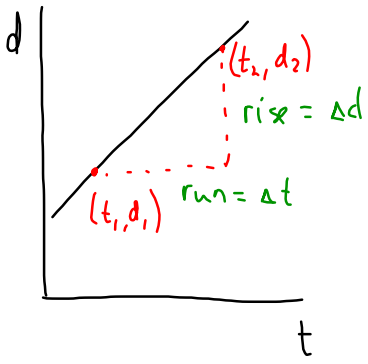
Position-Time Graphs + Velocity

Constant Velocity

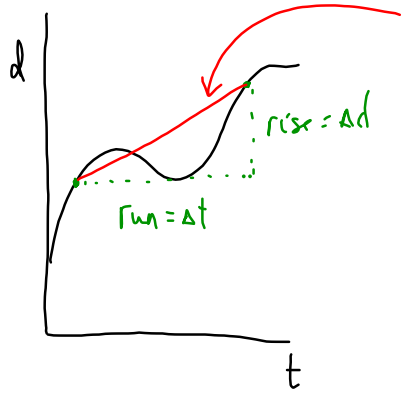


$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

$$\text{slope} = \frac{\Delta d}{\Delta t} = \text{VELOCITY}$$

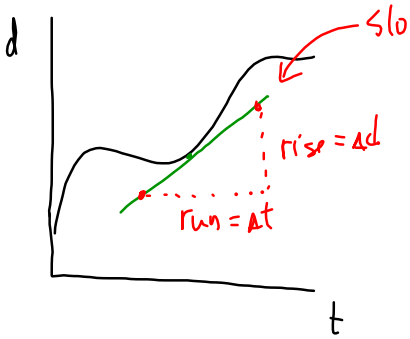
$$V = \frac{\Delta d}{\Delta t}$$

Non-Constant Velocity

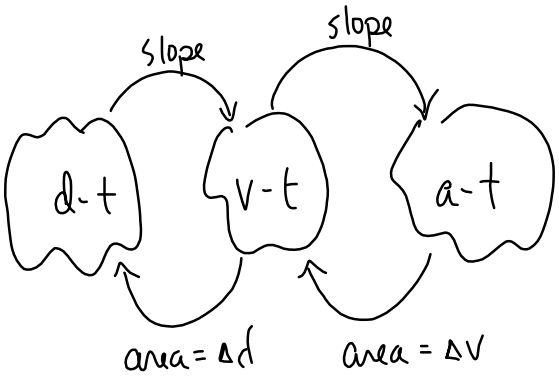


slope = average velocity

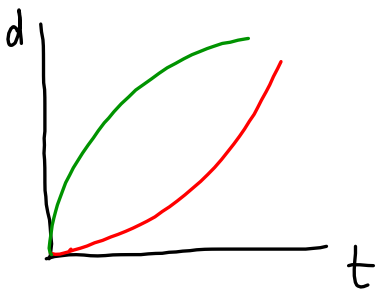
$$V_{ave} = \frac{\Delta d}{\Delta t}$$



$$V_{inst} = \frac{\Delta d}{\Delta t}$$

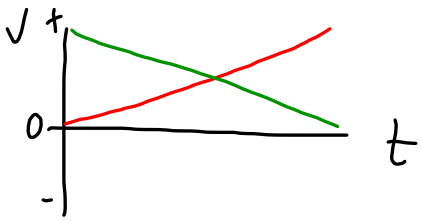


Kinematics Graphs



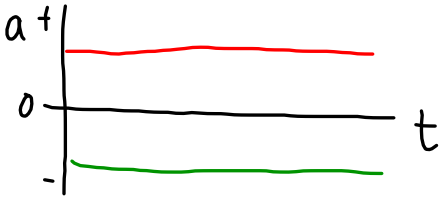
- speeding up steadily going away

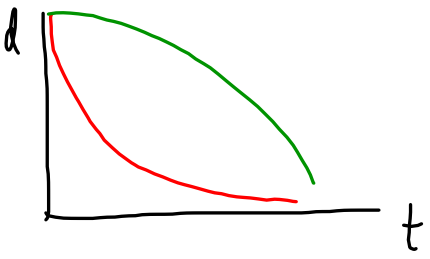
(+) (+) → (+ acc)



- slowing down steadily going away

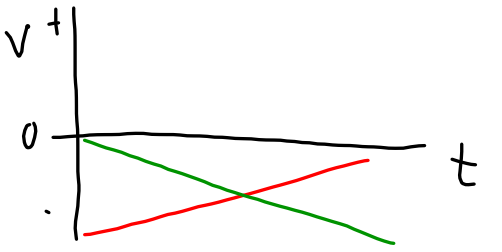
(−) (+) → (−acc)





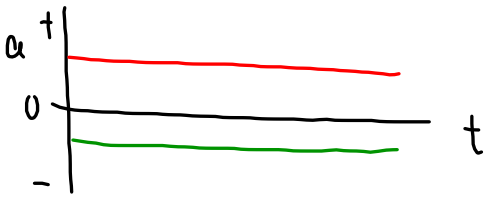
- slowing down steadily going towards.

(−) (−) → (+acc)



- Speeding up steadily going towards

(+) (−) → (−acc)



4. $a = 9.8\ m/s^2$

$V_1 = 0$

$V_2 = 3.00 \times 10^7\ m/s$

$\Delta t = ?$

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

$$a\Delta t = \Delta V$$

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

$$\Delta t = \frac{(3.00 \times 10^7\ m/s) - 0}{9.8\ m/s^2}$$

5. $a = 5.0\ km/h/s$

$\Delta t = 1.0\ min\ 60\ s$

m/s^2

$m/s/s$