

cheat sheet

$$s = \frac{d}{t} = \frac{d_1 + d_2}{t_1 + t_2}$$

$$a = \frac{v_f - v_o}{\Delta t}$$

$$v_f = v_o + at$$

$$d = v_o t + \frac{1}{2} at^2$$

$$v_f^2 = v_o^2 + 2ad$$

$$d = \left(\frac{v_o + v_f}{2} \right) t$$

← The Big Five

$$1 \text{ ft} = 12 \text{ in}$$

$$1 \text{ m} = 100 \text{ cm}$$

$$1 \text{ yd} = 3 \text{ ft}$$

$$1 \text{ km} = 1000 \text{ m}$$

$$1 \text{ kg} = 1000 \text{ g}$$

$$1 \text{ mi} = 5280 \text{ ft}$$

$$1 \text{ in} = 2.54 \text{ cm}$$

1.

$$\begin{array}{l|l} v_o & a \\ v_f & \\ \hline t & \end{array}$$

$$a = \frac{v_f - v_o}{\Delta t} = \left(\frac{15 \text{ m}}{\text{s}} - \frac{24 \text{ m}}{\text{s}} \right) \left(\frac{1}{12 \text{ s}} \right)$$

$$= \left(\frac{-9 \text{ m}}{\text{s}} \right) \left(\frac{1}{12 \text{ s}} \right)$$

$$= \boxed{-.75 \frac{\text{m}}{\text{s}^2}}$$

2.

$$V_0 = 85 \frac{\text{m}}{\text{s}}$$

$$V_f = 45 \frac{\text{m}}{\text{s}}$$

$$t = 4.5 \text{ s}$$

$$a = ?$$

V_0	a
V_f	
t	

$$a = \frac{V_f - V_0}{\Delta t} = \left(\frac{45 \frac{\text{m}}{\text{s}} - 85 \frac{\text{m}}{\text{s}}}{4.5 \text{ s}} \right) = \frac{-40 \frac{\text{m}}{\text{s}}}{(4.5 \text{ s})} = \boxed{-8.89 \frac{\text{m}}{\text{s}^2}}$$

3.

$$V_0 = 30 \frac{\text{m}}{\text{s}}$$

$$V_f = 0 \frac{\text{m}}{\text{s}}$$

$$t = 4.7 \text{ s}$$

V_0	a
V_f	
t	

$$d = \left(\frac{V_0 + V_f}{2} \right) \Delta t$$

$$d = \left(\frac{30 \frac{\text{m}}{\text{s}} + 0}{2} \right) \left(\frac{4.7 \text{ s}}{1} \right) = \frac{(30)(4.7) \text{ m}}{2} = \boxed{70.5 \text{ m}}$$

a	v_f
v_0	
t	

$$v_f = v_0 + at$$
$$= 20 \frac{\text{m}}{\text{s}} + \frac{14 \text{ m}}{\text{s}^2} (5 \text{ s})$$

$$\frac{20 \text{ m}}{\text{s}} + 70 \frac{\text{m}}{\text{s}} = \boxed{\frac{90 \text{ m}}{\text{s}}}$$