What You Need to Know

- Use equations of kinematics to solve problem in 1D and 2D

$$\Delta x = v_0 t + \frac{1}{2} a t^2$$

$$v = v_0 + at$$

$$\Delta x = \frac{1}{2}(v_0 + v_f)t$$

$$2a\Delta x = v_f{}^2 - v_0{}^2$$

$v_{avg} = \Delta x / \Delta t$ or $v_{avg} = \frac{1}{2}(v_0 + v_f)$

$g = 9.81 \text{ m/s}^2 \Downarrow$

- Tell the direction of acceleration from change in velocity

speeding up $\Leftrightarrow$ $\vec{v}$ and $\vec{a}$ point in same direction

slowing down $\Leftrightarrow$ $\vec{v}$ and $\vec{a}$ point in opposite directions

- If $\vec{a}$ is at an angle to $\vec{v}$, the object turns

$$\vec{v} = \vec{v}_0 + \vec{a}t,$$

if t is large, $\vec{v}$ & $\vec{a}$ point same direction