

position equation

$$y = -16t^2 + v_0 t + s_0$$

↑ speed
ft/sec
 ↑ height
ft.

ex1 convert 50 mi/hr to ft/sec

$$\frac{50 \text{ mi}}{1 \text{ hr}} \left(\frac{5280 \text{ ft}}{1 \text{ mi}} \right) \left(\frac{1 \text{ hr}}{60 \text{ min}} \right) \left(\frac{1 \text{ min}}{60 \text{ sec}} \right) = 73.3 \text{ ft/sec}$$

ex2 John dropped a penny from the top of SHS (450ft) tall. Where is the penny after 2 seconds?

$$y = -16t^2 + 450$$

$$y = -16(2)^2 + 450 \longrightarrow y = -64 + 450 = \boxed{386 \text{ ft}}$$

b) How long does it take to reach the ground?

$$0 = -16t^2 + 450$$

$$-450 = -16t^2$$

$$28.125 = t^2$$

$$\boxed{5.3 \text{ sec} = t}$$