

Spring (032) - Phys 101 – Sec # 5
Quiz # 1 (Ch. 2)

Name:

Key

ID #

1- A stone is thrown from the top of a building with an initial speed 20 m/s straight upward. The building is 50 m high. Calculate the velocity of the stone just before it hits the ground.

Given:

$$\Delta y = y_f - y_i = 0 - 50 = -50 \text{ m}$$

$$v_i = + 20 \text{ m/s}$$

$$a = - 9.8 \text{ m/s}^2$$

$$v = ?$$

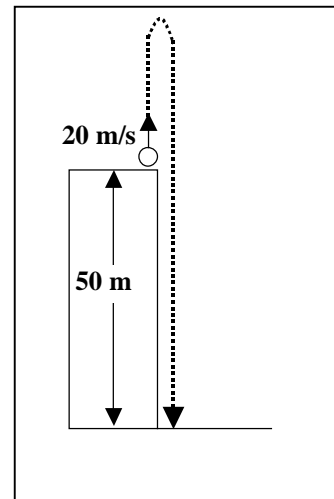
We use the equation:

$$v^2 - v_i^2 = 2 a \Delta y$$

$$v^2 - (20)^2 = - 2 (9.8) (-50) \quad \Rightarrow v^2 = 980 + 400$$

$$\Rightarrow v = + 37 \text{ or } - 37$$

we choose $v = -37 \text{ m/s}$ because the direction will be downward when it reaches the ground.



2- The position of an object moving along an X-axis is given by:

$$x = 3 + 12 t^2 - t^3$$

where x is in meters and t is in seconds. At what time is the acceleration of the object equal to zero?

$$V = dx/dt = 0 + 24 t - 3 t^2$$

$$a = dv/dt = 24 - 6 t = 0$$

$$\Rightarrow t = 4 \text{ s.}$$