

An object is dropped from a height of 30m above the ground.  
With what velocity does it strike the ground?

Given:

Displacement in the downward direction:

$$h = -30\text{m}$$

Since the object is dropped from above the ground, the initial velocity is  $v_i = 0 \text{ m/s}$ .

Acceleration in this case is acceleration due to gravity, acting in the downward direction. Its value is  $g = -9.8 \text{ m/s}^2$ .

Determine: final velocity of the object “ $v_f$ ”

$$v_f^2 = v_i^2 + 2gh \text{ ----- (1)}$$

Substituting for  $v_i$ ,  $g$  and  $h$  in (1):

$$v_f^2 = (0)^2 + 2(-9.8)(-30) = 588 \text{ m}^2/\text{s}^2$$

$$v_f = 24 \text{ m/s}$$