

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):

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

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