Q3. A stone is dropped from a height of 40m.
(a) How much time will it take to reach the ground?
(b) With what velocity will it strike the ground?

DATA:-
Initial Velocity = 0 ms-1
(b) Final Velocity = ?
(a) Time taken = ?
Height = h = 40m
Gravity = g = 10 ms-2

SOLUTION:-
(a) For time:-

$$g = \frac{v_f - v_i}{t}$$

$$t = \frac{v_f - v_i}{g}$$

$$t = \frac{(28.3) - (0)}{10}$$

$$t = \frac{28.3}{10}$$

$$t = 2.83 \text{ secs}$$

(b) For final velocity:-

$$2gh = v_f^2 - v_i^2$$

$$2(10)(40) = v_f^2 - 0$$

$$v_f^2 = 2(10)(40)$$

$$v_f^2 = 800$$

Taking $\sqrt{}$ both sides

$$\sqrt{v_f^2} = \sqrt{800}$$

$$v_f = 28.3 \text{ ms-1}$$