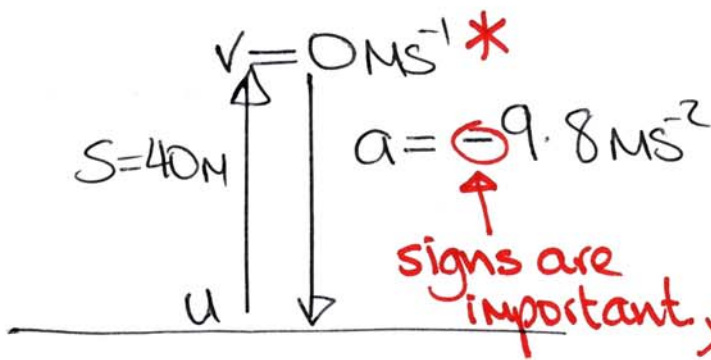


A ball is thrown to a height of 40m above its starting point. With what velocity was it thrown?



A diagram can help you to understand the problem.

* vertical speed is always 0 m/s at apex (max height)

$$u = ?$$

$$v = 0 \text{ m/s}$$

$$s = 40 \text{ m}$$

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

$$t = ?$$

use this information to select an equation of motion

$$\bullet v = u + at \quad \text{— no (don't know } u \text{ + } t \text{)}$$

$$\bullet s = ut + \frac{1}{2}at^2 \quad \text{— no (don't know } u \text{ + } t \text{)}$$

$$\bullet v^2 = u^2 + 2as \quad \text{— Yes!}$$

$$v^2 = u^2 + 2as$$

$$0^2 = u^2 + (2 \times (-9.8) \times 40)$$

$$0 = u^2 - 784$$

$$u^2 = 784$$

$$u = \sqrt{784}$$

$$\underline{u = 28 \text{ m/s}}$$