

In an experiment to find 'g', a steel ball is dropped from rest through a vertical distance of 40cm. The time taken is 0.29s. What value for 'g' does this result give?

$$g = a = ?$$

$$u = 0 \text{ m s}^{-1}$$

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

$$v = ?$$

$$t = 0.29 \text{ s}$$

Write down everything you know. Use this to choose a suitable equation

$$v = u + at \quad \text{no. too many unknowns.}$$

$$s = ut + \frac{1}{2}at^2 \quad \text{Yes}$$

$$v^2 = u^2 + 2as \quad \text{no. too many unknowns.}$$

$$s = ut + \frac{1}{2}at^2$$

$$0.4^* = (0 \times 0.29) + \left(\frac{1}{2} \times a \times 0.29^2\right)$$

$$0.4 = \frac{a \times 0.29^2}{2}$$

$$a = \frac{2 \times 0.4}{(0.29)^2}$$

$$\underline{a = 9.5 \text{ m s}^{-2}}$$

* Must convert from cm to metres.