Acceleration due to gravity ($g = 9.81 ms^{-2}$)

Example up is ⊕ down is ⊖

A ball is thrown vertically upwards with a speed of 5.0 ms^{-1}. Ignoring air friction, calculate how high it goes.

u $a = -9.81 ms^{-2}$ s

$u = +5.0 ms^{-1}$

$v = 0$

$a = -9.81 ms^{-2}$

$s = ?$

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

$v^2 - u^2 = 2as$

$s = \frac{v^2 - u^2}{2a}$

$s = \frac{0 - (5.0 ms^{-1})^2}{2(-9.81 ms^{-2})}$

$s = \frac{-25 m^2 s^{-2}}{-19.62 ms^{-2}}$

$s = 1.3 m$

The ball reaches a height of 1.3m.

Example

A horse falls from the edge of a cliff to the ground 25m below. How long before it hits the ground?

s (Neglecting air resistance)

$s = -25m$ (up is ⊕, down is ⊖)

$u = 0$

$a = -9.81 ms^{-2}$

$t = ?$

$s = ut + \frac{1}{2}at^2$ (u = 0)

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

$2s = at^2$

$t^2 = \frac{2s}{a}$

$t = \sqrt{\frac{2s}{a}}$

$t = \sqrt{\frac{2(-25m)}{-9.81 ms^{-2}}}$

$t = 2.3s$

If takes 2.3s for the horse to fall to the ground below

Find your reaction time by using a ruler:

$s = ?$ (the distance the ruler falls)

$u = 0$

$a = 9.81 ms^{-2}$ (down is ⊕)

$t = ?$

Popper Physics

- measure the height of the "pop" → 5 → mean.