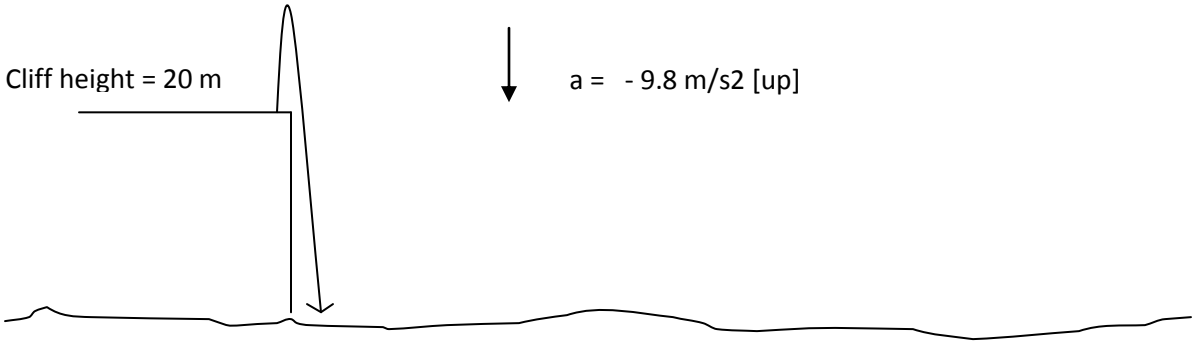
Free Fall Kinematics – Know the tricky bits!

'Free Fall' refers to an object falling without any additional forces ie: motors, rocket boosters. So a coin I drop or a pebble I throw off a bridge are both in 'free fall'. A skydiver is also in free fall with or without the parachute deployed.

We still have v_1, v_2, Δd, a and t for free fall. So you can still your 5 acceleration formulas! The trick is that sometimes information is not given to you, but you should know! For example, you should know: **(these are the tricky bits!)**

1. acceleration due to gravity (ignore air friction) = 9.8 m/s2 [down] for the **whole** trip!
2. the velocity at the apex (top of) an upwards flight is momentarily 0 m/s as it turns around.
3. And if you are launching something from a cliff and it lands below the cliff, usually you say the Δd is negative (since up is usually +ve)



Q1 : If the initial launch velocity was 15 m/s [up], how high did the object travel above the cliff?

G: v_1 = …… a = …….. v_2 = …… *think!*

R: Δd above cliff

A: formula to use is …….

S: & P:

Q2: How fast was the object travelling when it hit the ground below the cliff?

G: v_1 = …… a = **……..** Δd……. *think about Δd!*

R: v_2 when it hits the ground

A: formula to use is……

S: & P: