Physics – what are a few of the skills required to be successful on the course?

Rearranging equations

Task: Rearrange the equations below to make the unknown variable the subject. Then work out the unknown variable.

e.g. For question 1, you need to make d the subject and find out the value of d.

1.   Base Equation: **$v = d/t$** $v = 123$ m/s $t = 5$ s $d = ?$

2.   Base Equation: **$v_f = v_i + at$** $v_f = 32$ m/s $v_i = 0$ $a = 8.0$ m/s^2 $t = ?$

3.   Base Equation: **$1/2mv^2 = mgh$** $g = 9.80$ m/s^2 $h = 875$ m $v = ?$

4.   Base Equation: **$F = \dfrac{Gm_1m_2}{r^2}$** $F = 132$N $G = 6.67 \times 10^{-11}$ Nm^2/kg^2

    $r = .243$m $m_1 = 1.175 \times 10^4$ kg $m_2 = ?$

Reading and interpreting graphs

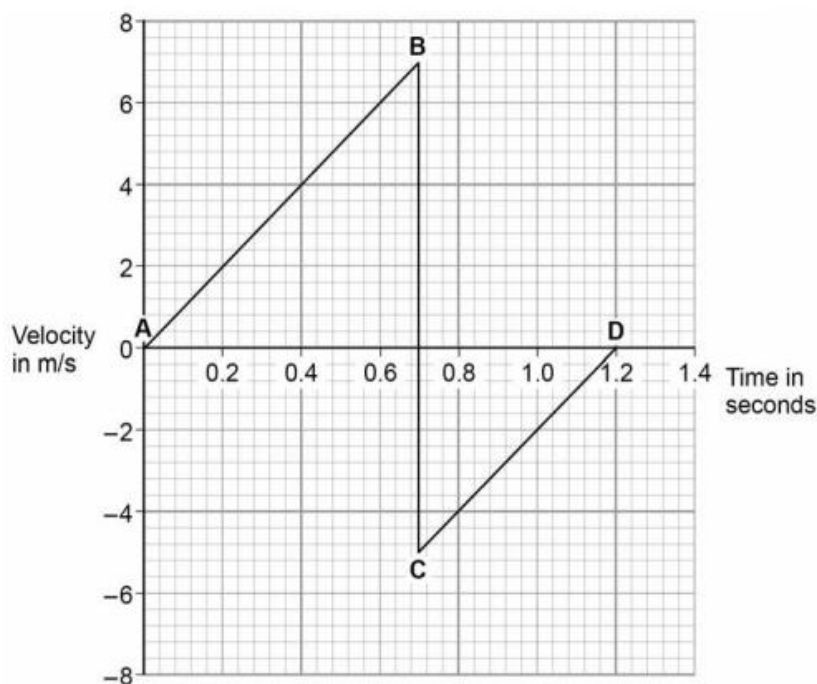Remember, change in velocity divided by change in time = acceleration

A child drops a ball.

The ball hits the ground and bounces.

Figure 1 shows the velocity-time graph for the ball from when the ball is dropped until when the ball reaches the top of its first bounce.

Air resistance has been ignored.

Figure 1

TASK: Use the graph above to help you answer these questions

1. what does the gradient of the graph represent?

2. Which point(s) on the graph is the ball stationary?

3. Which point(s) on the graph is the ball fastest?

4. Which point(s) on the graph is the ball travelling upwards

5. How does the graph provide evidence that the acceleration is constant?

Developing your Inquisitive nature and ability to express yourself:

A student in the class says "Lighter objects float on water while heavier objects sink"

TASK: Explain whether you agree or disagree with this statement using any physics you think is relevant.