28th April

1. A student is investigating the power output from a resistor connected to a battery that is made up of four cells in series, each with EMF 1.50 V and internal resistance 1.50 Ω.

   a. Write down the **EMF** and **internal resistance** of the battery

   b. State the **equation** used to calculate power output when a component has a current, I, passing through it and a potential difference, V, across it

   The student attaches the battery to an ammeter and a variable resistor in series. They then change the value of the external resistance, R, in the circuit.

   c. Complete the table below by calculating the **total resistance** in the circuit, the **current**, the terminal PD, and the **power** output in the external part of the circuit. The first column is already completed

External resistance, R / Ω	2.00	4.00	6.00	8.00	10.0	12.0
Total resistance (R + r) / Ω	8.00	10.00	12.00	14.00		
Current / A	0.750	0.600	0.500			
Terminal PD / V	1.50	2.40				
Power / W	1.13					

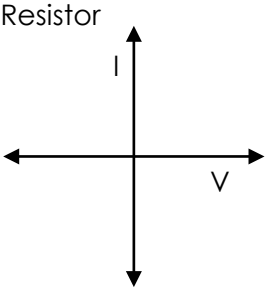
   d. Use the data in the table to **plot a graph** of power against external resistance, R, and deduce from your line of best fit the value of R for **maximum power**

29th April

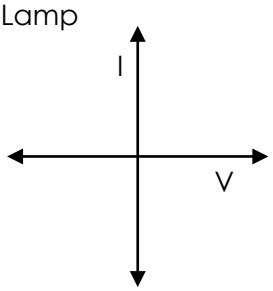
1 2 3

1. Sketch the **IV characteristics** of a:

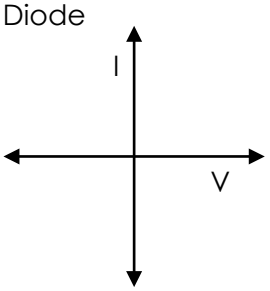
a. Resistor



b. Lamp



c. Diode

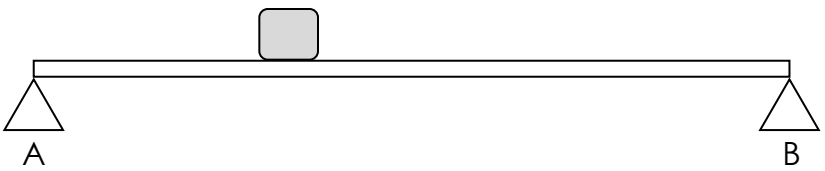


2. Define:

a. **Ohm's law**

b. **Resistance**

3. A uniform 104 g metre ruler is supported at each end by triangular pieces of metal at points A and B as shown in diagram below. A 250 g mass is supported with the centre of mass exactly 67.0 cm from end B.



a. Calculate the total **anti-clockwise** moment of the ruler and mass about the point B

b. Calculate the **force** provided by support A