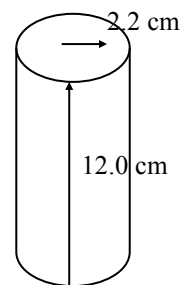
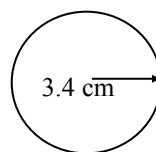
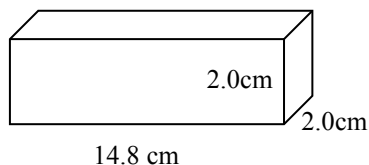
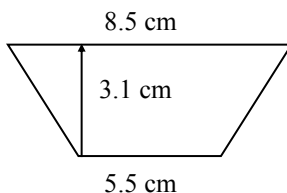
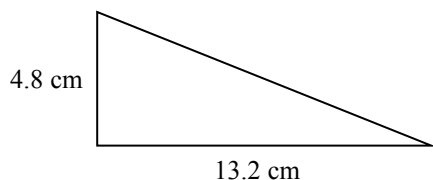


# Preparing for Physics A Level

Your success in Physics will require you to be able to cope with GCSE mathematics. It is essential that you are familiar with the material contained in this worksheet. To avoid your brain 'forgetting' the basics over the long summer, please complete the activities for the second week of your course.

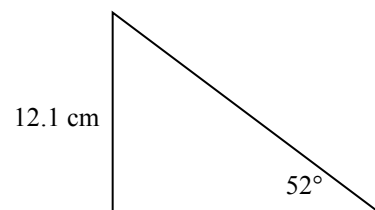
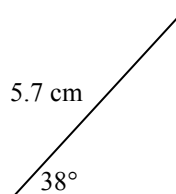
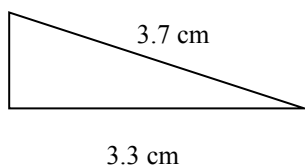
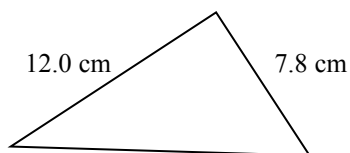
## Task 1: Areas and Volumes

Calculate the area or volume of the following shapes.



## Task 2: Pythagoras and Trigonometry

Find all of the missing sides and angles for the following triangles.

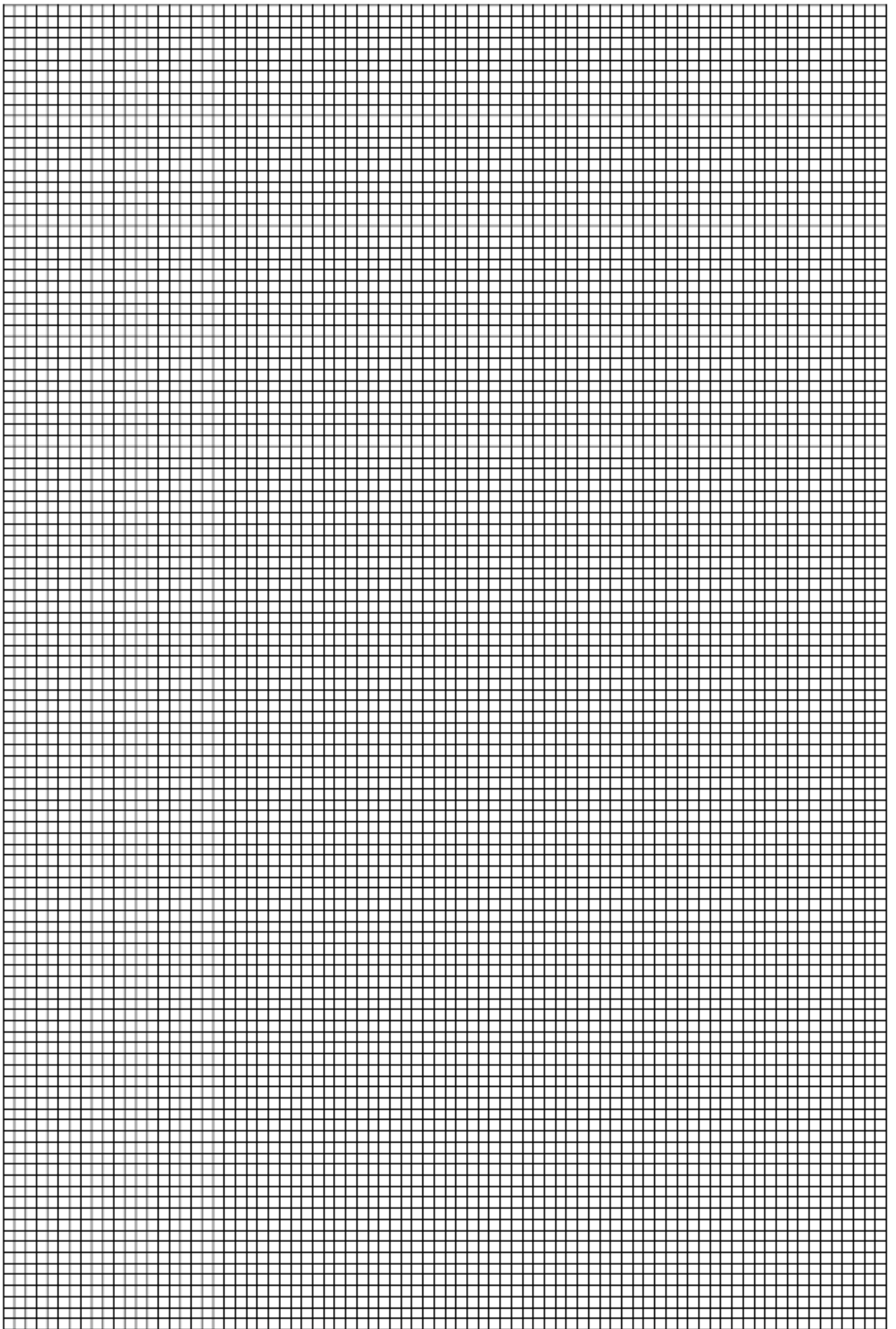


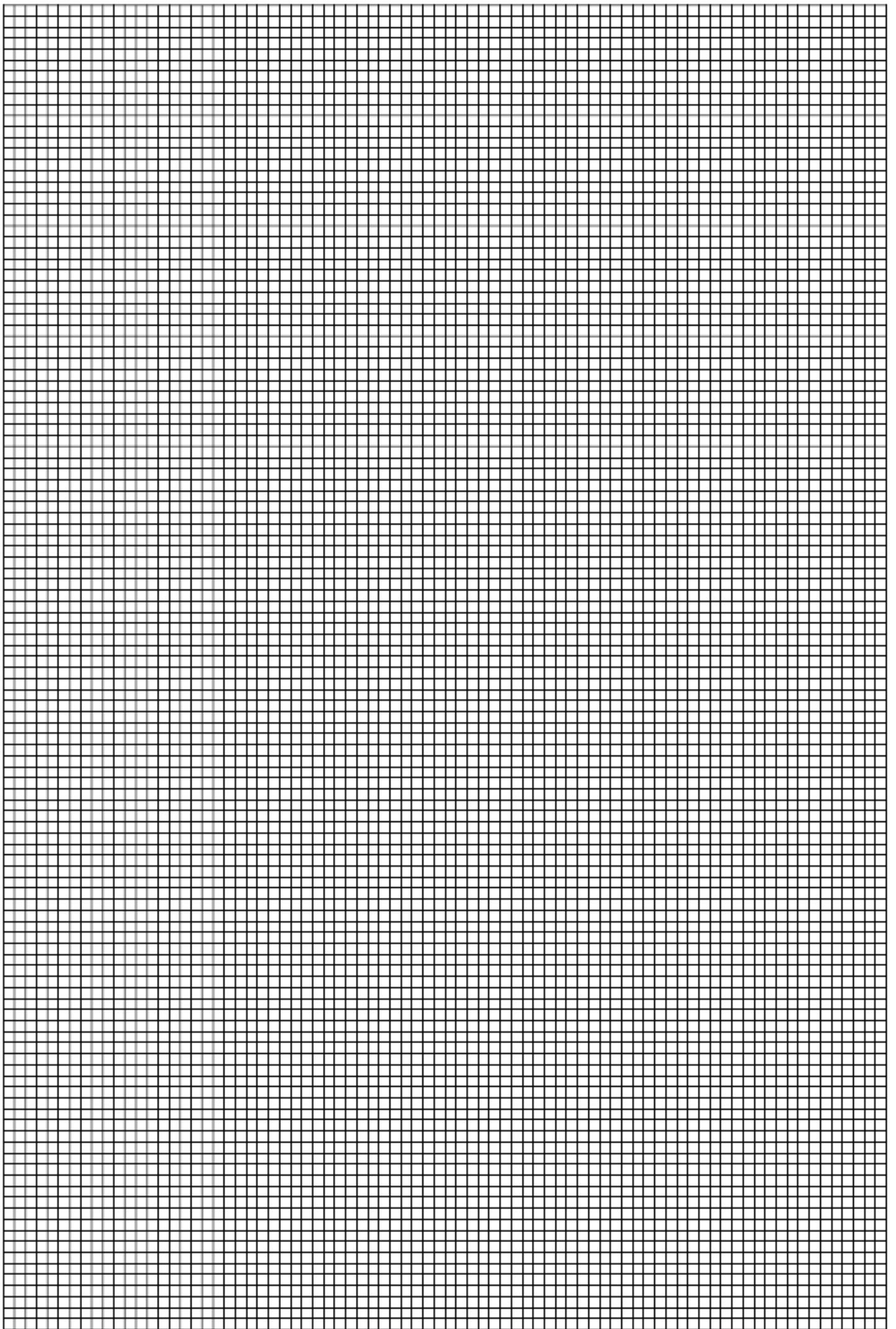
## Task 3: Graphs

Plot graphs of the following data. Draw in a line of best fit and determine the gradient and intercept for the following graphs.

| Temperature | Volume of Gas |
|-------------|---------------|
| 0           | 0             |
| 10          | 17            |
| 20          | 26            |
| 30          | 33            |
| 40          | 43            |
| 50          | 58            |
| 60          | 63            |

| Number of paperclips | Time for spinner to fall |
|----------------------|--------------------------|
| 2                    | 13                       |
| 4                    | 12.5                     |
| 6                    | 11.5                     |
| 8                    | 11                       |
| 10                   | 10                       |
| 12                   | 9.7                      |





#### Task 4: Percentages

1. You score 59 out of 70 marks in a test. What is your percentage?
2. A 20W bulb has a power output of 12W. Calculate its percentage efficiency.

In experiments we use percentages to see how close our result is to the expected value. Using the example below to guide you, work through the questions that follow:

An experiment determines a value of  $14\Omega$  for a resistor. The manufacturer claims that it has a value of  $15\Omega$ . Calculate the percentage difference.

$$(15 - 14) \div 15 = 0.0667$$
$$0.0667 \times 100 = 7\%$$

3. An experiment determines a value of gravitational field strength to be 8.67 N/kg. The accepted value is 9.81 N/kg. Calculate the percentage difference.
4. An experiment determines a value of  $215\mu\text{F}$  for a capacitor. The manufacturer claims that it has a value of  $220\mu\text{F}$ . Calculate the percentage difference.

#### Task 5: Calculations

Work through the following, remembering to show your workings. You may need to refer to your GCSE Physics notes for the appropriate formulae.

1. a) Estimate how long it takes for light to travel from the Sun to the Earth if the speed of light is  $3 \times 10^8 \text{ m/s}$   
  
b) The Ultra Violet light from the Sun has a wavelength range of  $1 \times 10^{-9} - 3.7 \times 10^{-7} \text{ m}$ . Calculate the range of frequencies
2. A swimmer swims at a speed of 2m/s in still water. If he swam in a river which had a current of 1m/s, what would be his velocity if he
  - a) swam with the current?
  - b) swam against the current?
3. a) Calculate the current in a  $33\text{k}\Omega$  resistor connected to a 5V supply.  
  
b) The most commonly used resistors have a power rating of 0.25W. What is the maximum current that can flow through when connected across a 5V supply?