AQA

# FSMQ
# ALGEBRA AND GRAPHS
## Level 2

June 2016

# Preliminary Material

## Data Sheet

**To be opened and issued to candidates between Tuesday 26 April 2016 and Tuesday 10 May 2016**

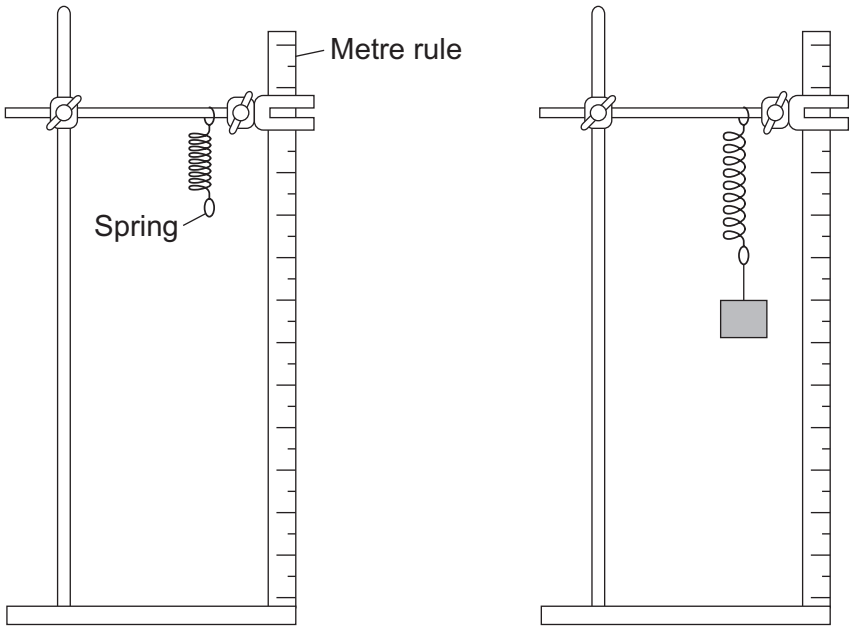
**REMINDER TO CANDIDATES**

YOU MUST **NOT** BRING THIS DATA SHEET WITH YOU WHEN YOU SIT THE EXAMINATION. A CLEAN COPY WILL BE MADE AVAILABLE.

**INFORMATION**

The Preliminary Material is to be seen by teachers and candidates **only**, for use during preparation for the examination on Tuesday 17 May 2016. It **cannot** be used by anyone else for any other purpose, other than as stated in the instructions issued, until after the examination date has passed. It must **not** be provided to third parties.

**Physics experiment**




Sandie is a student.
She performs an experiment in which she hangs different weights on the end of a spring which is hanging vertically.
She measures the length of the spring for each weight, and completes the table below.

| | | | | | |
|---|---|---|---|---|---|
| **Weight ($m$ kg)** | | | | | |
| **Length ($L$ cm)** | | | | | |

Sandie thinks that there might be a linear relationship between the weight and the length.

## $CO_2$ emissions

The table below shows data on the carbon dioxide emissions of some countries in 2010

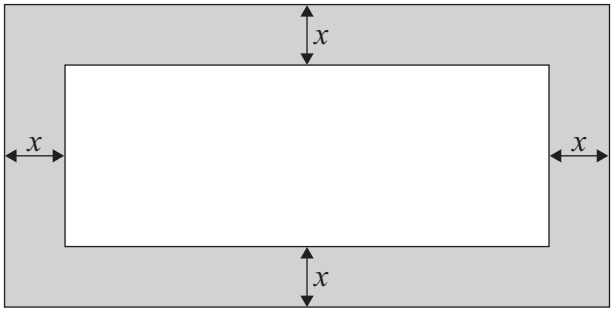
| Country | Population | Total $CO_2$ emissions (tonnes) | $CO_2$ emissions per capita (tonnes) |
|---|---|---|---|
| Afghanistan | 28 398 000 | 8 236 000 | 0.290 |
| Belgium | 10 920 000 | 108 947 000 | 9.98 |

## Printer cartridges

Jacob buys printer cartridges for a school.
The cost of a colour cartridge is not the same as the cost of a black cartridge.

## Birthday cake

Monica is a cake-maker.
She wants to make a rectangular cake which has a border around it.
The border will be topped with blue icing.
The diagram shows the cake as seen from above.



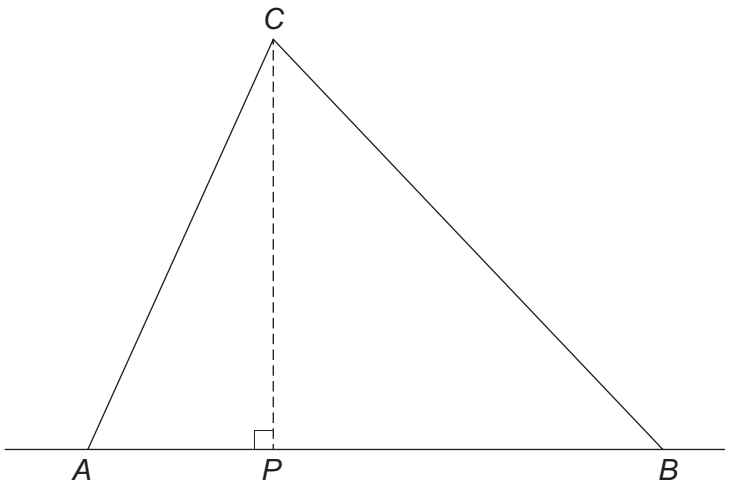

Not to scale

The width of the border is $x$ centimetres.
Monica only has enough blue icing to cover 300 square centimetres of cake.
She decides to calculate the value of $x$ which will make the total area of the border equal to 300 $cm^2$

## Landscape gardener

Steve is a landscape gardener.
In his work he has to measure distances and right angles accurately.

Steve has always used a very long tape measure for this work, but this is heavy and awkward to use. He buys a laser distance measurer, but he is not sure how he can use it to measure right angles.




Steve asks the advice of his friend Rachel, who is a maths teacher.
Rachel says that, if Steve knows the distance between two points *A* and *B* on a line, and he also knows the distance from a point *C* to each of the points *A* and *B*, he will be able to work out the position of the point *P* such that angle *APC* is a right angle.

## School trip

A group of children travel on two coaches on a school trip.
Both coaches stop at a cafe for a break.
One coach leaves and drives along a main road.
The other coach leaves 80 seconds later.
The first coach waits by the side of the road in a layby until the other coach catches up.
A speed/time graph can be used for each coach to show its speed at a particular time.

**END OF DATA SHEET**