

Pearson Edexcel Level 1/Level 2 GCSE (9 – 1)

Mathematics

Paper 3 (Non-calculator)

Common questions: Foundation/Higher tier

Mock Set 2

Spring 2017

Paper Reference

1MA1/3F - 3H

You must have:

Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Instructions

- Use **black** ink or ball-point pen.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- **Calculators may be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 24
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. A is the point with coordinates (2, 10)
B is the point with coordinates (5, d)

Clip 201

The gradient of the line AB is 4

Work out the value of d.

$d = \dots\dots\dots$

(Total for Question 1 is 3 marks)

2. Sophia pays £222 for a plane ticket.
She also pays 100 euros airport tax.

The exchange rate is £1 = 1.38 euros.

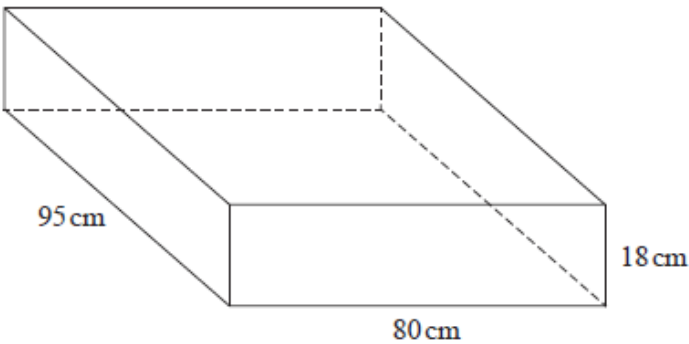
What percentage of the total cost of the ticket and the airport tax does Sophia pay for the airport tax?

Give your answer correct to 1 decimal place.

.....%

(Total for Question 2 is 3 marks)

3. A sofa has 6 identical cushions.
Each cushion is a cuboid 18 cm by 80 cm by 95 cm.



The cushions are covered with a protective spray.
The protective spray is in cans.

The label on each can has this information.

Spray in this can covers 4 m^2

- (a) Work out how many cans are needed to cover the 6 cushions with protective spray.

.....
(5)

The information on each label is inaccurate.
The spray in each can covers 10% more than 4 m^2 .

- (b) How will this affect the number of cans needed for the 6 cushions?
You must show how you get your answer.

.....

.....

.....

(2)

(Total for Question 3 is 7 marks)

4. $\mathbf{a} = \begin{pmatrix} 1 \\ 4 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$

(a) Write down as a column vector

(i) $\mathbf{a} + \mathbf{b}$

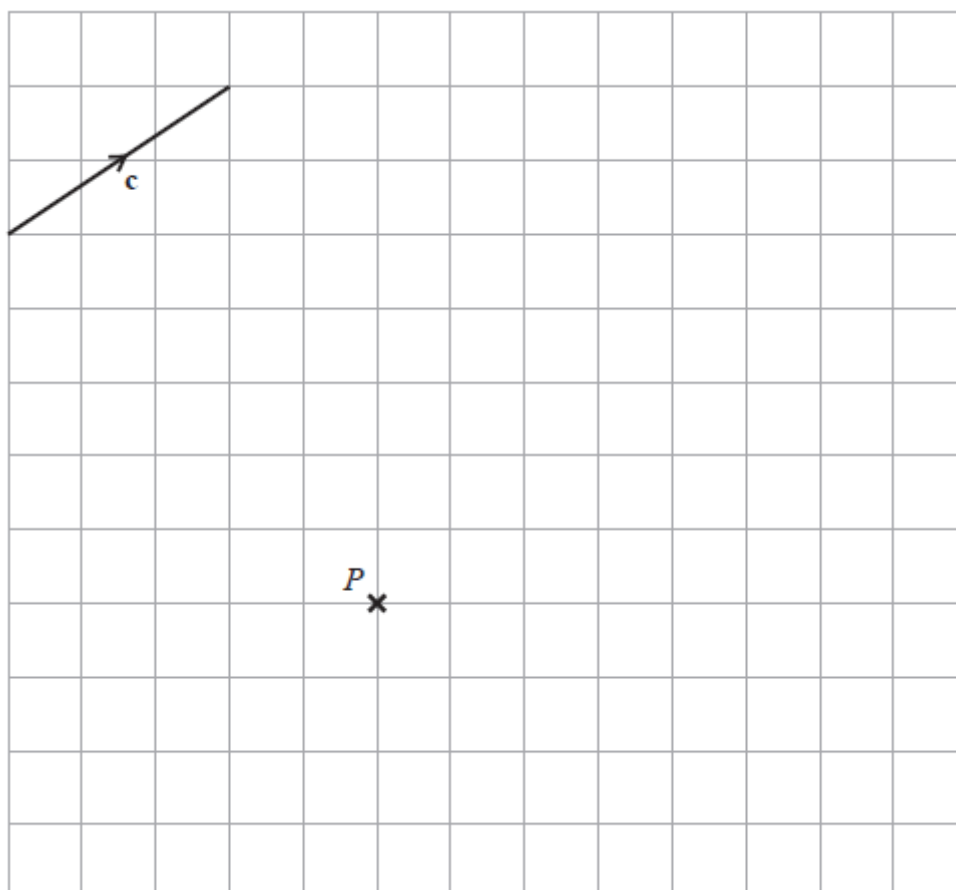
.....

(ii) $2\mathbf{a} + 3\mathbf{b}$

.....

(3)

The vector \mathbf{c} is drawn on the grid.



(b) From the point P , draw the vector $2\mathbf{c}$

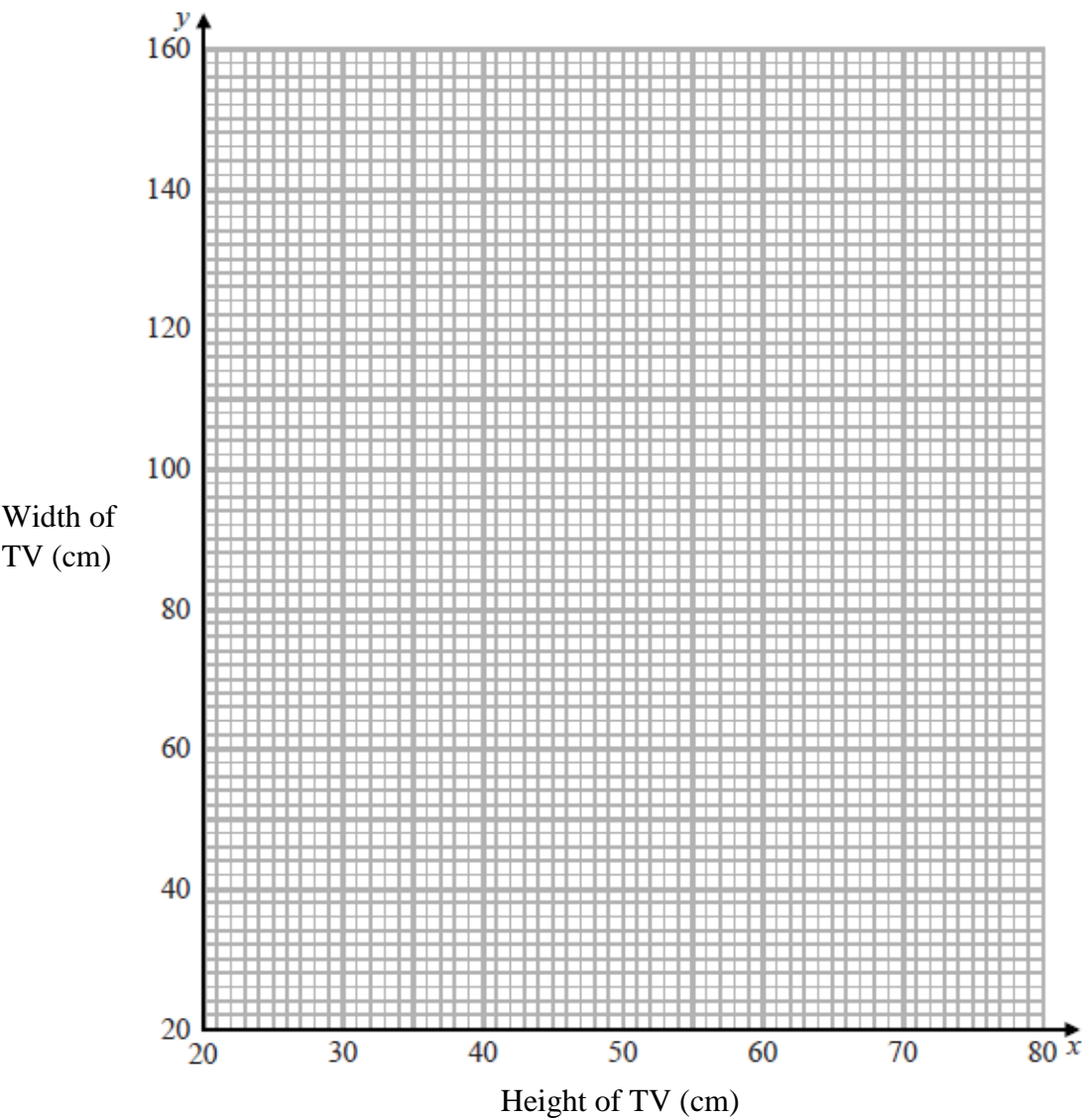
(1)

(Total for Question 4 is 4 marks)

5. The height (x cm) and the width (y cm) of TVs are in the ratio 9 : 16

(a) Use this information to draw a graph to show the relationship between the height and the width of TVs.

Use values of x from 20 to 80



(2)

A TV has a width of 90 cm.

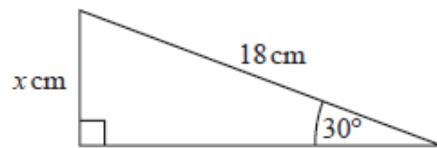
(b) Use your graph to work out the height of this TV.

..... cm
(1)

(Total for Question 5 is 3 marks)

6.

**Clips 509
and 510**



Work out the value of x .

.....
(Total for Question 6 is 2 marks)

7. A train travels from Madrid to Malaga at an average speed of 183 km/h.

The train leaves Madrid at 08 40

The train arrives at Malaga at 11 28

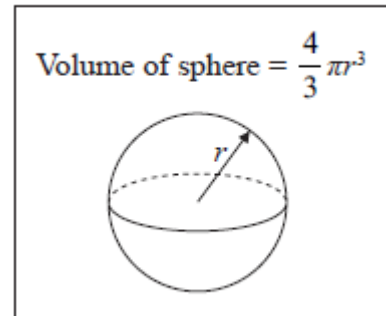
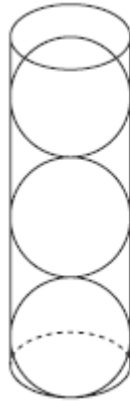
**Clips 719,
709, 710**

Work out the distance the train travels from Madrid to Malaga.

..... km

(Total for Question 7 is 3 marks)

8. A hollow cylinder has radius r cm and height $6r$ cm.
3 spheres, also of radius r cm, are put into the cylinder.



- (a) Work out the proportion of the cylinder that is **not** filled by the spheres.

.....
(3)

The height of the cylinder is increased by $2r$ cm.
Another sphere of radius r cm is put into the cylinder.

Malcolm says,

“There is no change in the proportion of the cylinder **not** filled by the spheres.”

- (b) Is Malcolm correct?
Justify your answer.

.....
.....

(1)

(Total for Question 8 is 4 marks)

TOTAL FOR PAPER: 24 MARKS

Mark scheme

Question 1 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{d-10}{5-2} = 4$	P1	This mark is given for a process to process to use the gradient
	$\frac{d-10}{3} = 4$ so $d-10 = 12$	P1	This mark is given for a process to for a complete process to rearrange equation formed to isolate d
	$d = 22$	A1	This mark is given for the correct answer only

Question 2 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$100 \div 1.38 (= £72.46)$ or $222 \times 1.38 (= €306.36)$	P1	This mark is given for a process to use the currency conversion rate
	$\frac{72.46}{222+72.46} = 0.2461$ or $\frac{100}{306.36+100} = 0.2461$	P1	This mark is given for a complete process to find the percentage required
	24.6%	A1	This mark is given for an answer in the range 24.6 – 24.61

Question 3 (Total 7 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$95 \times 18 = 1710$ $80 \times 18 = 1440$ $95 \times 80 = 7600$	P1	This mark is given for a process to for process to find the surface area of at least two different faces
	$(1710 + 1440 + 7600) \times 2 = 21500$	P1	This mark is given for a complete process to find the surface area of one cushion
	$4 \text{ m}^2 = 40\,000 \text{ cm}^2$	P1	This mark is given for a process to convert units
	$\frac{21500 \times 6}{40000} (= 3.225)$	P1	This mark is given for a process to find the number of spray cans required
	4 cans	A1	This mark is given for the correct answer only (whole number of cans)
(b)	$\frac{21500 \times 6}{44000} = 2.93$	P1	This mark is given for a process to find the number of cans needed (the surface area of 6 cushions divided by the new area covered by one spray can)
	The number of tins required will be reduced to three	C1	This mark is given for a correct statement supported by correct working

Question 4 (Total 4 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
(a)(i)	$\begin{pmatrix} 1+3 \\ 4+2 \end{pmatrix} = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$	B1	This mark is given for the correct answer only
(a)(ii)	$2\mathbf{a} = \begin{pmatrix} 2 \\ 8 \end{pmatrix}$ or $3\mathbf{b} = \begin{pmatrix} 9 \\ 6 \end{pmatrix}$	M1	This mark is given for a method to use either $\begin{pmatrix} 2 \\ 8 \end{pmatrix}$ or $\begin{pmatrix} 9 \\ 6 \end{pmatrix}$
	$\begin{pmatrix} 2+9 \\ 8+6 \end{pmatrix} = \begin{pmatrix} 11 \\ 14 \end{pmatrix}$	A1	This mark is given for the correct answer only
(b)	Correct line from P drawn on diagram	B1	This mark is given for a correct vector drawn

Question 5 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Graph drawn	M1	This mark is given for a method to draw a line of gradient $\frac{16}{9}$ drawn, with at least two correct points plotted
	Fully correct graph	C1	This mark is given for a fully correct graph drawn
	48 – 52	B1	This mark is given for answer in the range 48 – 52

Question 6 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\sin 30^\circ = \frac{x}{18}$ or $x = 18 \times \sin 30^\circ$	M1	This mark is given for a method to find out a value for x
	$\sin 30^\circ = 0.5$, so $x = 9$	A1	This mark is given for the correct answer only

Question 7 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$11\ 28 - 08\ 40 = 2\ \text{hrs}\ 48\ \text{mins} (= 2.8\ \text{hrs})$	P1	This mark is given for a process to find the journey time
	$2.8 \times 183 =$	P1	This mark is given for a complete process to find the distance travelled
	512.4	A1	This mark is given for the correct answer only

Question 8 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\pi r^2 \times 6r$	P1	This mark is given for a process to find volume of cylinder
	$\frac{3 \times \frac{4}{3} \pi r^3}{\pi r^2 \times 6r} = \frac{2}{3}$	P1	This mark is given for complete process to find the volume of 3 spheres divided by the volume of the cylinder
	$\frac{1}{3}$	A1	This mark is given for the correct answer only (the proportion not filled)
(b)	Proportion between number of spheres and relevant height cylinder remains constant	C1	This mark is given for a correct statement