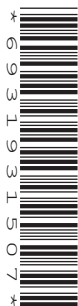


GCSE (9–1) Mathematics
J560/02 Paper 2 (Foundation Tier)

Monday 6 November 2017 – Morning
Time allowed: 1 hour 30 minutes



You may use:

- Geometrical instruments
- Tracing paper

Do not use:

- A calculator



First name										
Last name										
Centre number						Candidate number				

INSTRUCTIONS

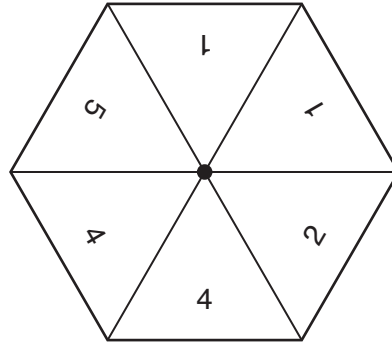
- Use black ink. You may use an HB pencil for graphs and diagrams.
- Complete the boxes above with your name, centre number and candidate number.
- Answer **all** the questions.
- Read each question carefully before you start to write your answer.
- Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided.
- If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the barcodes.

INFORMATION

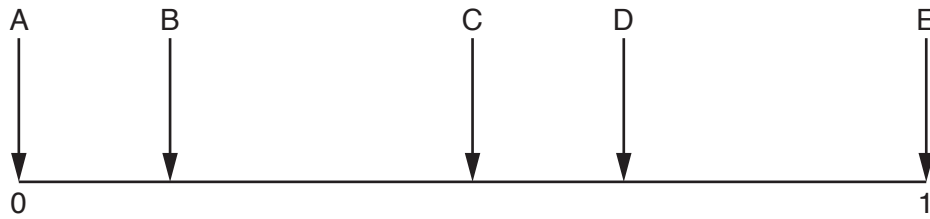
- The total mark for this paper is **100**.
- The marks for each question are shown in brackets [].
- This document consists of **20** pages.

Answer **all** the questions.

- 1** A fair spinner has six sides.
They are labelled 1, 1, 2, 4, 4, 5.



The diagram shows a probability scale.



Which arrow shows the probability of

- (a)** scoring a 2,

(a)[1]

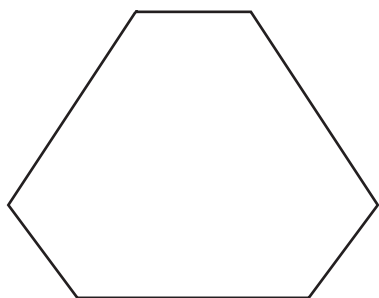
- (b)** scoring a number less than 6,

(b)[1]

- (c)** scoring a 1 or a 4?

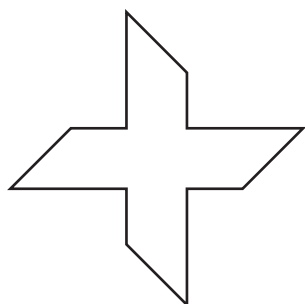
(c)[1]

- 2 (a) Write down the number of lines of symmetry of this hexagon.



(a) [1]

- (b) Write down the order of rotation symmetry of this shape.



(b) [1]

- (c) A triangle has just one line of symmetry.

Write down the mathematical name of this type of triangle.

(c) [1]

- (d) Sara says

All parallelograms have 2 lines of symmetry and rotation symmetry of order 2.

Explain why Sara is not correct.

.....
 [1]

- 3 A 100 g packet of tea costs £4.16.
A 25 g packet of the same tea costs £1.05.

Which packet is better value for money?
Show how you decide.

..... [3]

- 4 One morning, **eight** buses arrive at a bus stop.
The number of minutes late for each bus is shown below.

0 7 2 6 9 2 0 7

In the afternoon, two more buses arrive at the bus stop.

The median number of minutes late of **all ten** buses is 3.5.
The mode number of minutes late of **all ten** buses is 0.

How many minutes late were the two afternoon buses?

..... and minutes [3]

- 5 Write 0.26 as a fraction.
Give your answer in its simplest form.

..... [2]

- 6 (a) Simplify fully.

(i) $4(c + 2d) + 3(3c - 5d)$

(a)(i) [3]

(ii) $4a \times 5b$

(ii) [1]

- (b) Factorise fully.

(i) $6g + 8h$

(b)(i) [1]

(ii) $5x^2 - 15x$

(ii) [2]

7 (a) Work out.

(i) $1 + 4 \div 2$

(a)(i) [1]

(ii) $2 + 5 \times (8 - 4)$

(ii) [1]

(b) Evaluate.

(i) 2^5

(b)(i) [1]

(ii) $\sqrt{400}$

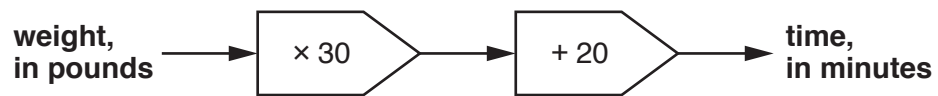
(ii) [1]

(c) Estimate the value of

$$\frac{23.1 \times 3.9}{8.12}.$$

(c) [3]

- 8 This is a rule to find the time, in minutes, needed to roast lamb.



- (a) Use the rule to work out the time needed to roast a piece of lamb which weighs 4 pounds.

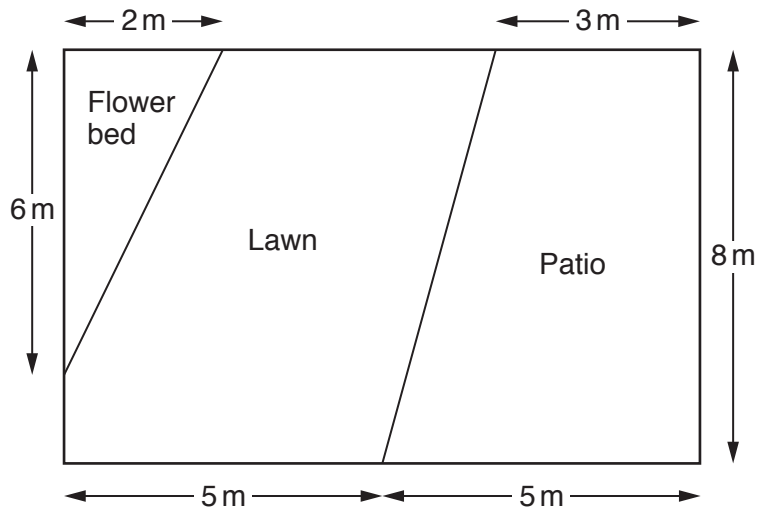
(a) minutes [2]

- (b) A different piece of lamb takes 95 minutes to roast.

Use the rule to work out the weight of this piece of lamb.

(b) pounds [2]

- 9 The diagram represents a rectangular garden of length 10 m and width 8 m. The flower bed is a triangle and the patio is a trapezium. The rest of the garden is lawn.

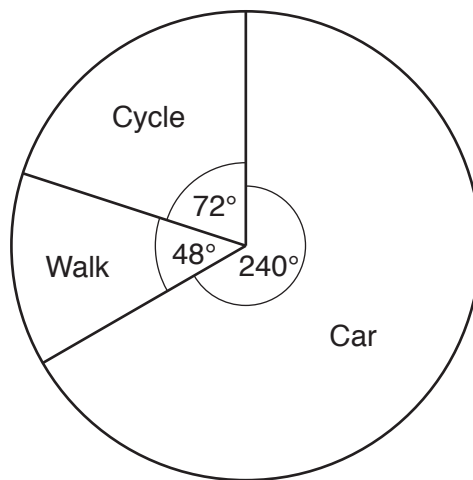


Not to scale

Work out the area of the lawn.

..... m² [6]

10 This pie chart shows how the employees of a business travel to work.



Not to scale

- (a) Find the ratio of the number of employees who cycle to work to the number of employees who walk to work.
Give your answer in its simplest form.

(a) : [2]

- (b) 80 employees travel to work by car.

Work out the number of employees who cycle to work and the number of employees who walk to work.

(b) cycle

walk [3]

- 11 (a) Georgia is 4 feet 2 inches tall.
There are 12 inches in a foot.

Use the conversion, 1 inch = 2.5 centimetres, to convert Georgia's height into metres.

(a) m [3]

- (b) Owen weighs 6 stones 4 pounds.
There are 14 pounds in a stone.

Use the conversion, 2.2 pounds = 1 kilogram, to convert Owen's weight into kilograms.

(b) kg [3]

- 12** Jack carries out a survey in his school.
He selects 50 students, at random, and asks them

Do you think that it is a good idea to have women-only railway carriages?

These are his results.

	Number of students
Yes	32
No	13
Don't know	5

- (a)** What percentage of the students in Jack's survey answered 'Yes'?

(a) % **[3]**

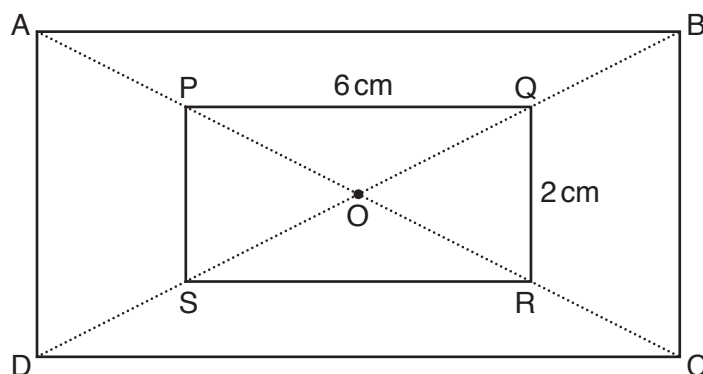
- (b)** Jack says

My survey shows that people in England think that it is a good idea to have women-only railway carriages.

Explain why Jack may be wrong.

.....
 **[1]**

- 13 ABCD and PQRS are rectangles.
O is the centre of both rectangles.



Not to scale

AC is a straight line passing through P, O and R.
BD is a straight line passing through Q, O and S.

$PQ = 6 \text{ cm}$ and $QR = 2 \text{ cm}$.

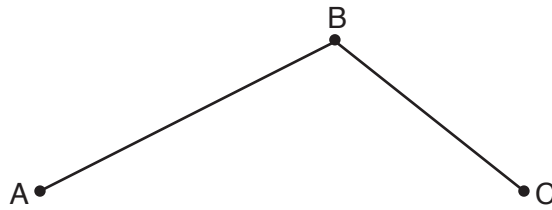
The perimeter of rectangle ABCD is 40 cm.

Work out the length and width of rectangle ABCD.

length = cm

width = cm [3]

- 14 Halina cycled from A to B at an average speed of 26 km per hour.
She then cycled from B to C at an average speed of 20 km per hour.



Not to scale

She left A at 10.00 am, did not stop at B and arrived at C at 3.00 pm.

- (a) It took Halina x hours to cycle from A to B.

- (i) Explain why the distance from A to B, in kilometres, is $26x$.

.....
 [1]

- (ii) Write down an expression, in terms of x , for the **time** taken to cycle from B to C.

(a)(ii) hours [2]

- (iii) Hence show that the **distance** from B to C, in kilometres, is $100 - 20x$.

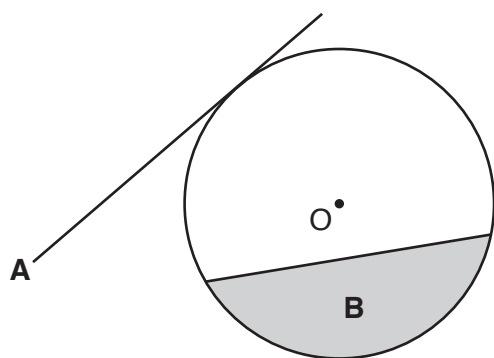
..... [1]

- (b) The **total distance** cycled by Halina from A to C is 118 km.

Find the distance from A to B.

(b) km [4]

- 15 The diagram shows a circle, centre O.



Write down the mathematical name of

- (a) line A,

(a) [1]

- (b) shaded region B.

(b) [1]

- 16 (a) Write the next term in each of these sequences.

(i) 1 1 2 3 5 8

(a)(i) [1]

(ii) 2 4 8 16 32 64

(ii) [1]

- (b) Write an expression for the n th term of the sequence below.

15 12 9 6

(b) [2]

17 Andrew is thinking of a number.

- It is between 1 and 150.
- It is one more than a square number.
- It is three less than a cube number.
- It is not a prime number.

What is Andrew's number?

You must show all your reasoning.

..... [4]

18 (a) Factorise.

$$x^2 - 43^2$$

(a) [1]

(b) Calculate.

$$57^2 - 43^2$$

(b) [2]

19 The angles in a triangle are in the ratio 1 : 2 : 3.

(a) Show that the triangle is a right-angled triangle.

[2]

(b) The hypotenuse of the triangle is 15 cm long.

Calculate the length of the shortest side in the triangle.

(b) cm [4]

20 There is a total of 250 men, women and children on a train.

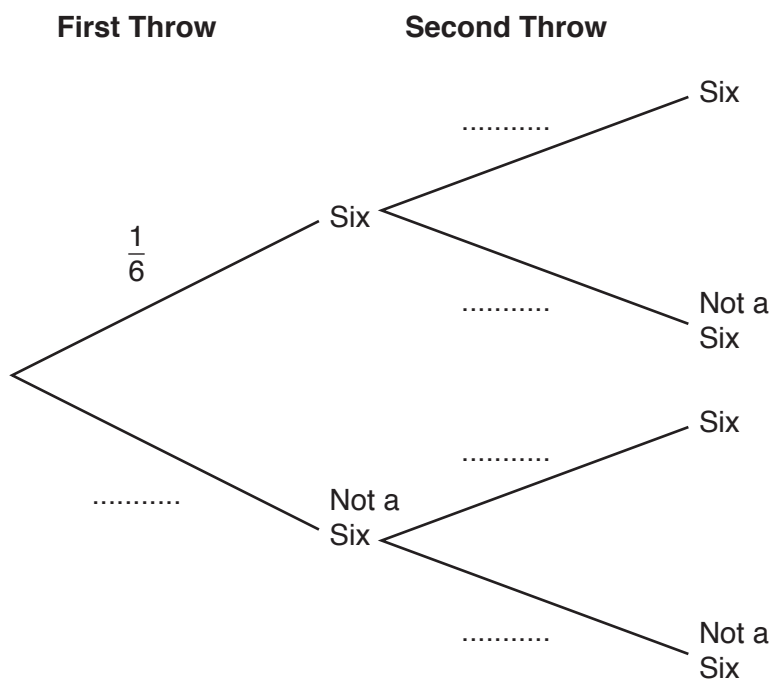
The ratio of men to women is 4 : 5.

The ratio of women to children is 10 : 7.

How many men are on the train?

..... [4]

- 21 (a) Noah starts to draw a tree diagram showing the outcomes of throwing a six when a fair dice is thrown twice.



- (i) Complete the tree diagram.

[1]

- (ii) What is the probability of throwing two sixes?

(a)(ii) [2]

- (b) Cara throws the same dice three times.

Show that the probability that Cara does not throw a six until her third throw is $\frac{25}{216}$. [2]

- 22 (a) Beth is given the following question.

Work out

$$4.1 \times 10^5 \times 3 \times 10^2.$$

Give your answer in standard form.

This is Beth's answer to the question.

$$12.3 \times 10^7$$

Explain why Beth's answer is incorrect.

.....
..... [1]

- (b) Show that

$$4.5 \times 10^2 + 7.3 \times 10^3 = 7.75 \times 10^3.$$

[2]

23 (a) n is an integer.

(i) Explain why $2n + 1$ is an odd number.

.....
..... **[1]**

(ii) Write down an algebraic expression for the next odd number after $2n + 1$.

(a)(ii) **[1]**

(b) Use algebra to show that the sum of two consecutive odd numbers will always be a multiple of 4. **[2]**

END OF QUESTION PAPER

[illegible]

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