

Surname	Centre Number	Candidate Number
Other Names		0



## GCSE LINKED PAIR PILOT

4362/01



S15-4362-01

## APPLICATIONS OF MATHEMATICS

### UNIT 2: Financial, Business and Other Applications FOUNDATION TIER

P.M. THURSDAY, 11 June 2015

1 hour 30 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	5	
2.(a)	4	
2.(b)	7	
2.(c)	5	
3.	3	
4. (a)(b)	2	
4.(c)(d)	8	
4.(e)	9	
5.	3	
6.	9	
7.	6	
8.	6	
9.	6	
10.	2	
11.	5	
<b>Total</b>	<b>80</b>	

### ADDITIONAL MATERIALS

A calculator will be required for this paper.

### INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take  $\pi$  as 3.14 or use the  $\pi$  button on your calculator.

### INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

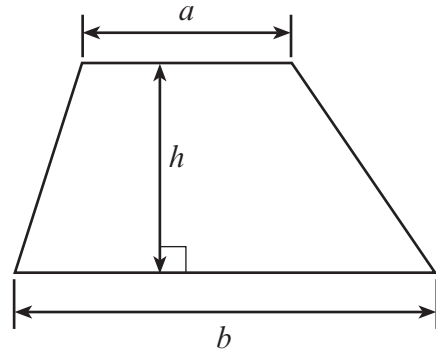
Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question 4(e).

**Formula List**

**Area of trapezium** =  $\frac{1}{2}(a + b)h$



**Volume of prism** = area of cross-section  $\times$  length



1. Sara took part in the RSPB's *Big Garden Birdwatch* where the numbers of different types of birds are counted in a garden for an hour.

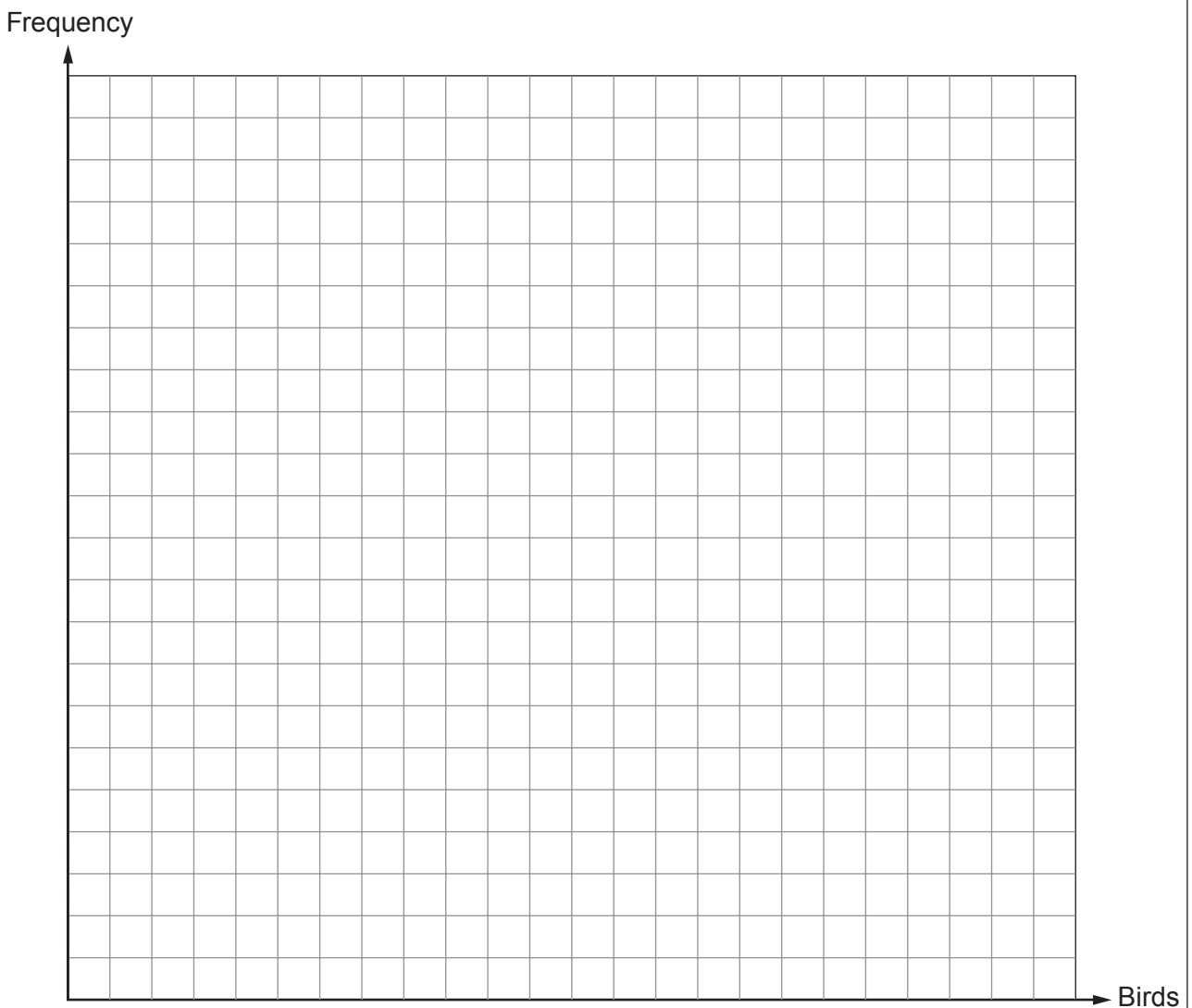


Here are Sara's results:

Type of bird	Sparrow	Pigeon	Blackbird	Robin
Frequency	13	8	9	5

- (a) Draw a bar chart to display this information.

[4]



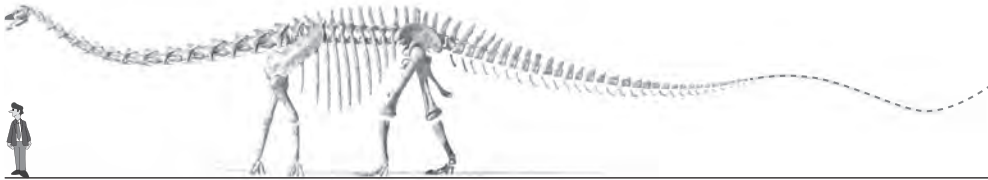
- (b) Complete the following sentence with the types of bird.

[1]

The total number of ..... and ..... counted in Sara's garden is the same as the number of ..... counted.

2. Sean and Annie visit the Natural History Museum.

- (a) Whilst at the museum, they visit the central hall where the *Diplodocus* dinosaur is on display. Sean tries to estimate the length of the dinosaur.



Write down an estimate for the **actual height** of a man. ....

Using this estimate for the height of the man, estimate the **actual length** of the *Diplodocus* dinosaur.

You must show all your working.

[4]

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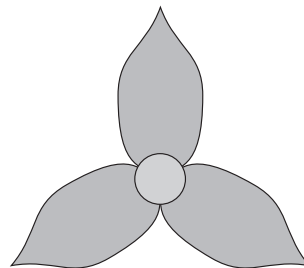
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- (b) Annie is interested in symmetry in nature.

- (i) Draw all the lines of symmetry on each of the pictures below.

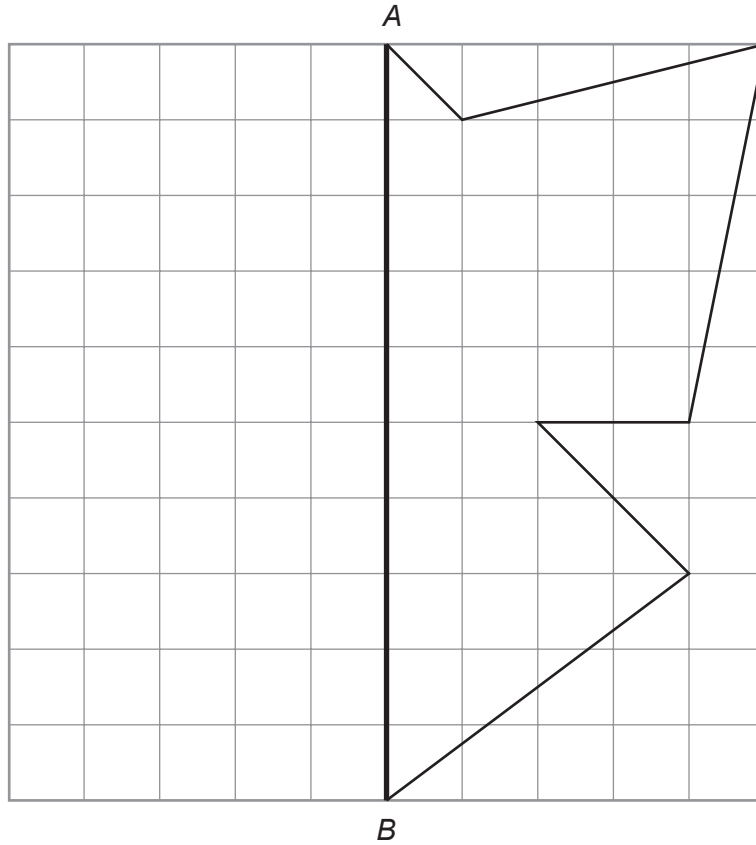
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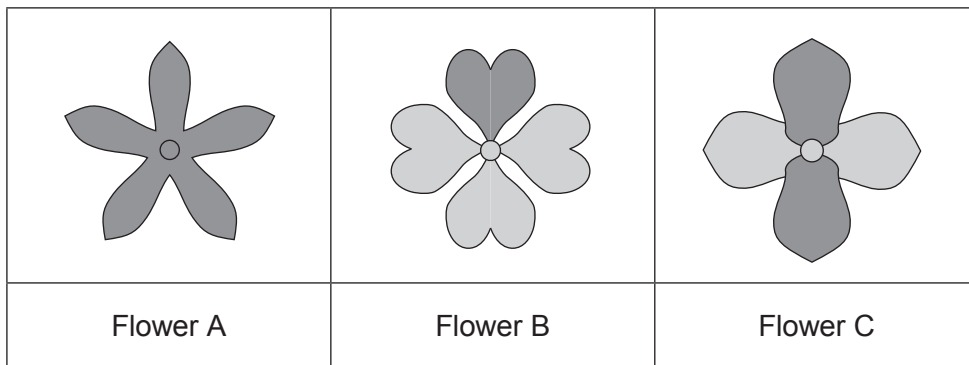
- (ii) Annie visits the wildlife garden at the Natural History Museum and is amazed by the symmetry of the butterflies. She draws part of a sketch of a butterfly.

Complete Annie's sketch using  $AB$  as the line of symmetry.

[2]



- (iii) In the wildlife garden, Annie notices that some of the flowers have rotational symmetry.



In the table below, write down the order of rotational symmetry of each of the flowers shown.

[2]

Flower	A	B	C
Order of rotational symmetry			

- (c) The table shows the number of visitors to the museum each year from 2010 to 2013.

Year	Number of visitors
2013	5 289 685
2012	4 891 692
2011	4 712 197
2010	4 388 944

- (i) Find the difference between the number of visitors in the years 2010 and 2013. [1]

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- (ii) Sean said that the total number of visitors to the museum from 2010 to 2013 was 20 million, correct to the nearest million.  
Is Sean correct?  
Give a reason for your answer. [2]

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- (iii) When looking at the data, the customer-relations manager of the museum rounds the figures correct to 2 significant figures.  
Write the number of visitors for the year 2013 correct to 2 significant figures. [1]

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- (iv) In a particular month, there were 400 612 visitors to the museum.  
Write this number in words. [1]

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3. Pria was given 3 equations to solve.

$$a + 9 = 2$$

$$3b = 240$$

$$c - 5 = -1$$

Solve the 3 equations for Pria.

[3]

- $a + 9 = 2$

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- $3b = 240$

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- $c - 5 = -1$

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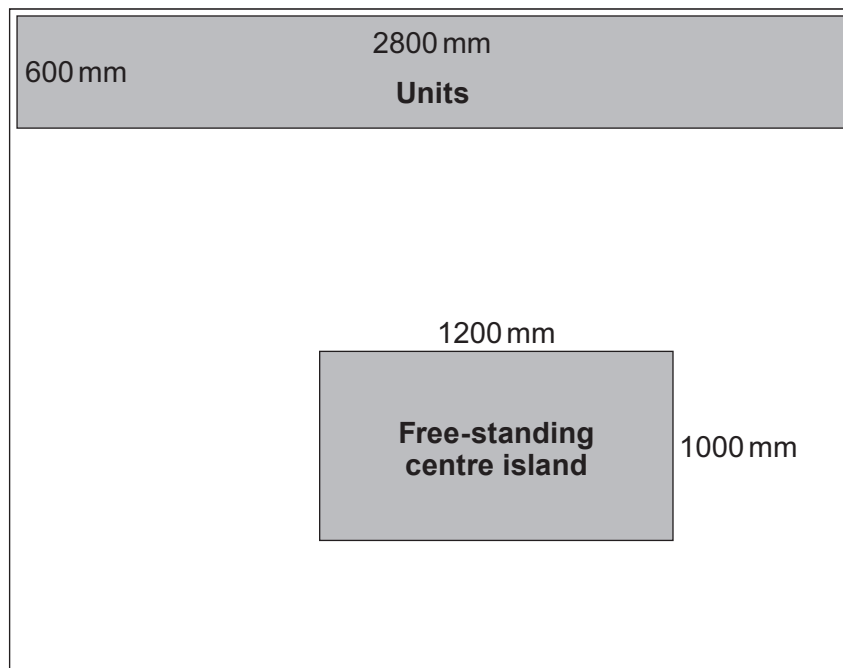
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4. Owen and Nia are having a new kitchen. They plan to buy a long section of units to place against one wall and a free-standing centre island.



The kitchen designer creates a floor plan for Owen and Nia's kitchen. The measurements for kitchens are usually given in mm.



*Diagram not drawn to scale*

- (a) Change 600 mm to cm.

[1]

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- (b) Change 2800 mm to m.

[1]

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- (c) Owen and Nia need to know the total area of the floor **covered** by the units against the wall and the free-standing centre island.  
Calculate this area.  
State the units of your answer. [5]

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- (d) The free-standing centre island requires an edging strip to go around the outside.  
The edging strips can be bought in rolls of length 2 m, 5 m, 10 m or 50 m.  
The cost per metre is the same for each roll.  
Which length of roll would be the best option for Owen and Nia to buy?  
Show all your working and give a reason for your answer. [3]

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(e) *You will be assessed on the quality of your written communication in this part of the question.*

Owen and Nia look into buying their kitchen.

They need to buy:

- kitchen cabinets and worktops for £3200,
- electrical goods for £2649,
- sink and drainer for £250.

A local kitchen fitter charges £1200 but can offer them a discount of 10% for his work.

An electrician charges £600.

A plumber has a £40 call out fee and then charges £25 per hour.

The plumber needs 2 hours to complete his work.

A large kitchen company says they charge £8000 for everything including fitting.

Should Owen and Nia choose the large kitchen company to fit their kitchen?

Give a reason for your answer.

You must show all your working.

[9]

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5. A numeracy test is marked out of 40.  
The marks for a class of 24 pupils are shown below.

11	24	35	31	9	17	27	23
39	18	27	5	34	25	21	15
36	12	12	7	40	22	3	19

- (a) Represent the marks for the class in a stem and leaf diagram.

[2]

- (b) Which of the following shows how to calculate the range of the numeracy test marks?  
Circle your answer.

[1]

$19 - 11 = 8$

$40 - 9 = 31$

$40 - 3 = 37$

$40 - 24 = 16$

6. One sunny Sunday morning, the owner of *Lizzy's Ices* ice cream van recorded the number of ice-cream sales.

Flavour of ice cream	Number sold
Vanilla	22
Strawberry	17
Chocolate	12
Banana	15
Toffee	6



- (a) Draw a pie chart to represent the number of ice-cream sales made by *Lizzy's Ices*. You should show how you calculate the angles of your pie chart. [4]

*Working:*

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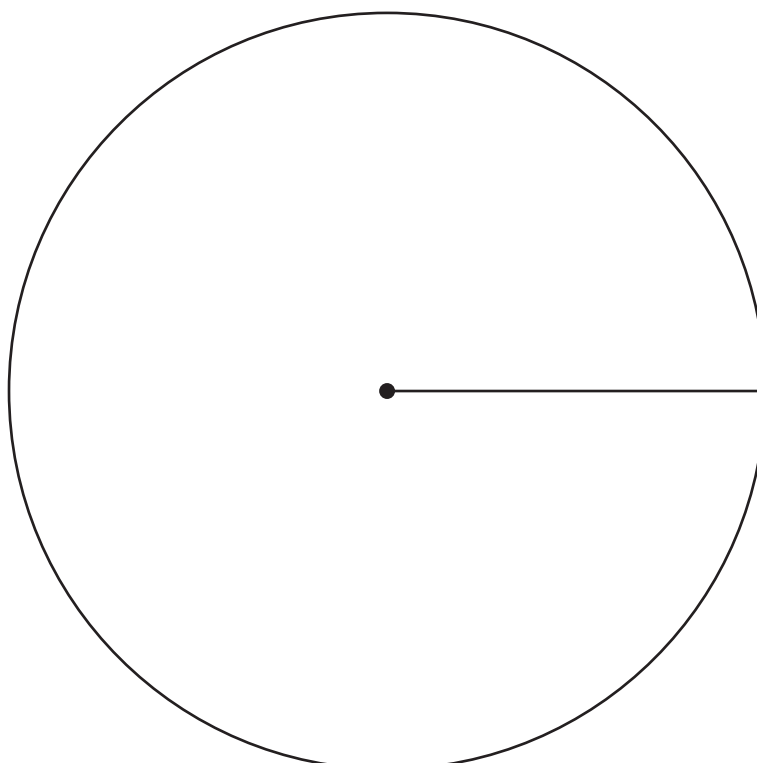
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- (b) On the same Sunday morning, another ice-cream van, *Cameron's Cones*, sold 90 ice creams.  
Of these 90 ice creams, 18 were chocolate flavour.  
Who sold the higher proportion of chocolate flavour ice creams?  
You must show your working. [5]

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7. Lois lives in Llandudno.  
She is changing some pounds into other currencies before going on holiday in Europe.

The exchange rates are displayed below.

Exchange £1 for	
1.48 SF	Swiss francs
1.20 €	euros
5.04 Zl	Polish zloty

- (a) Calculate how much Lois would receive in exchanging each of the following.

- (i) £450 exchanged for Swiss francs.

[2]

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 ..... Swiss francs

- (ii) £300 exchanged for Polish zloty.

[2]

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 ..... Polish zloty

- (b) How many pounds will Lois have to exchange to receive 363.60 euros?

[2]

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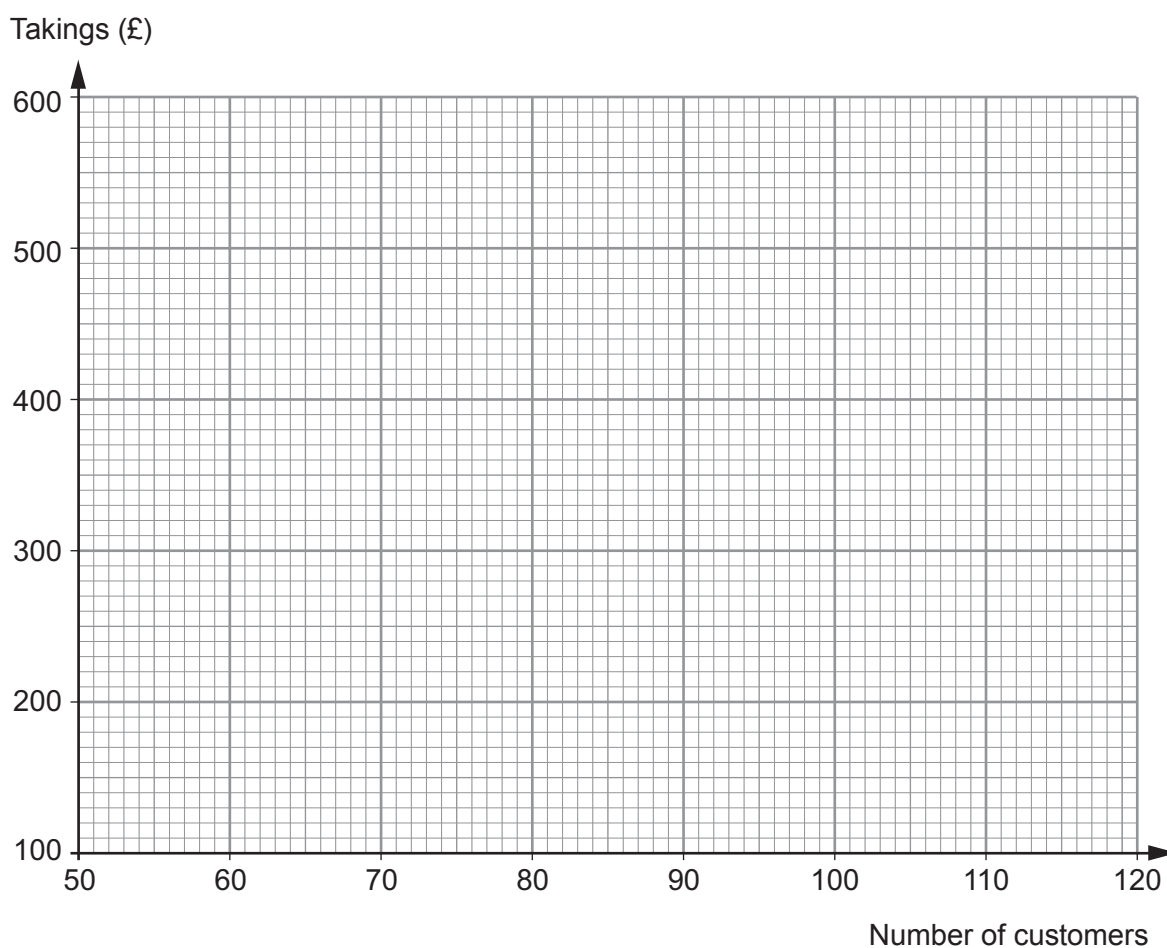
8. Every Monday for 6 weeks, the number of customers entering a juice bar and the takings of the juice bar were recorded.  
The takings were recorded correct to the nearest £10.

The table below shows the results.

Number of customers	104	82	120	64	70	118
Takings (£)	480	390	560	290	310	530

- (a) On the graph paper below, draw a scatter diagram of these results.

[2]





(b) Draw, by eye, a line of best fit on your scatter diagram. [1]

(c) Estimate the takings for a Monday when there are 95 customers. [1]

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(d) Approximately how much does a customer spend, on average, in the juice bar on a Monday? [2]

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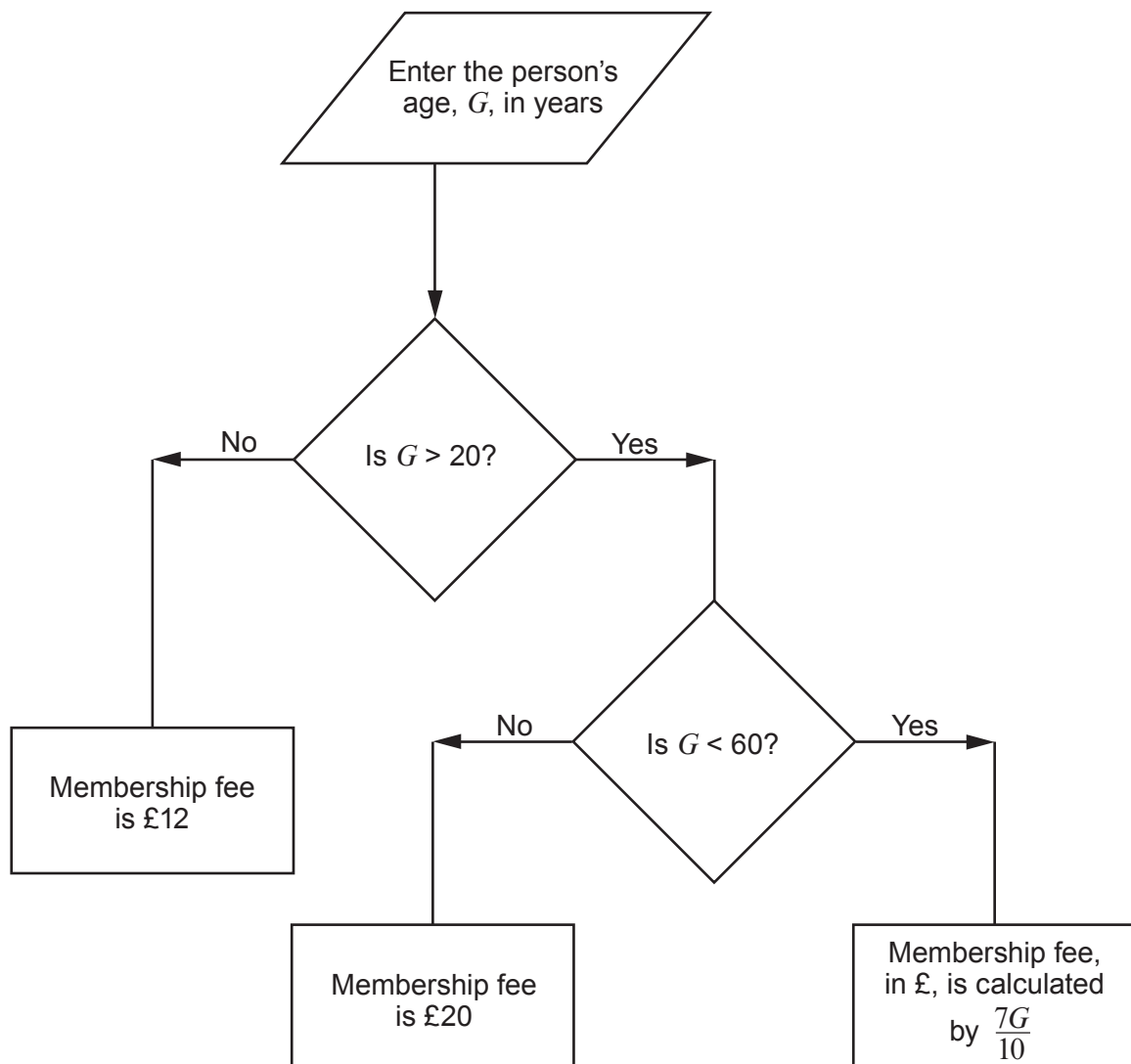
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The following section of a flowchart is used to find the membership fee for a snooker club.



(a) Use this section of the flowchart to find the membership fee for each of the following people.

Donald, aged 20 [1]

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Dawn, aged 16 [1]

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Shiona, aged 52 [2]

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(b) Shiona, aged 52, has a younger brother Marc, aged 42.  
How much **less** does Marc have to pay to be a member of the snooker club than his sister Shiona? [2]

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10. A retail index number is calculated by looking at increases or decreases in price over a period of time.  
 A loaf of bread that cost £1.60 on 1<sup>st</sup> January last year, costs £2.00 on 1<sup>st</sup> January this year.



The index number for this year's cost of a loaf of bread, based on last year's cost, is calculated as follows:

$$\begin{aligned} \text{Index number} &= \frac{2.00}{1.60} \times 100 \\ &= 125 \end{aligned}$$

The index number for this year's cost of bananas, based on last year's cost, is 140.



- (a) Has the cost of bananas increased more or less steeply than the cost of a loaf of bread? You must give a reason for your answer. [1]

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- (b) For this year's costs, are you able to tell from the information given whether 1 kg of bananas is cheaper or more expensive than a loaf of bread? You must give a reason for your answer. [1]

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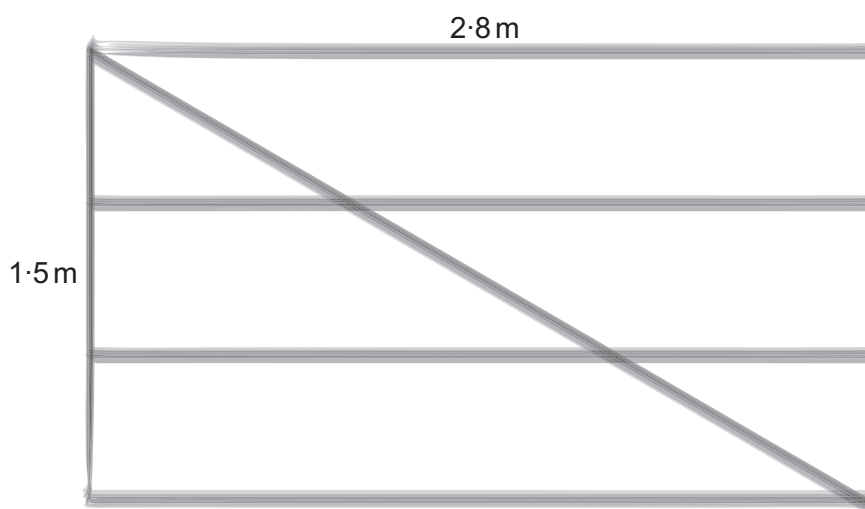
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11. Derek wants to have a rectangular metal gate made for his driveway.

The gate must be 2.8 m wide and 1.5 m high.  
The gate is to be made using 7 thin metal rods.  
The four horizontal rods are parallel.  
The diagonal rod ensures that the gate remains strong.

Derek draws a sketch of his design.



*Diagram not drawn to scale*

Calculate the **total** length of the 7 rods needed to make Derek's gate.

[5]

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