

Surname	Centre Number	Candidate Number
Other Names		0



GCSE LINKED PAIR PILOT

4362/01



S16-4362-01

APPLICATIONS OF MATHEMATICS

UNIT 2: Financial, Business and Other Applications FOUNDATION TIER

P.M. THURSDAY, 16 June 2016

1 hour 30 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	8	
2.	8	
3.	4	
4.(a)(b)	6	
4.(c)	5	
5.	3	
6.	8	
7.	2	
8.	5	
9.	6	
10.	3	
11.	5	
12.	9	
13.	8	
Total	80	

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 π as 3.14 or use the π 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.

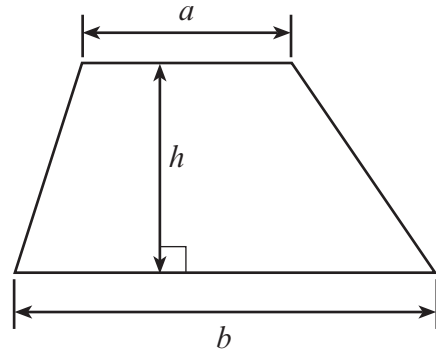
Scale drawing solutions will not be acceptable where you are asked to calculate.

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

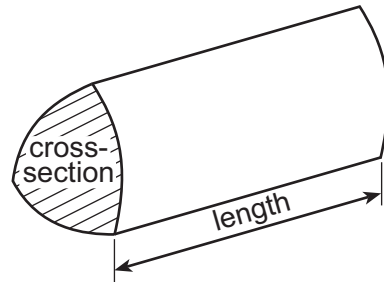
You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question 6.

Formula List

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



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

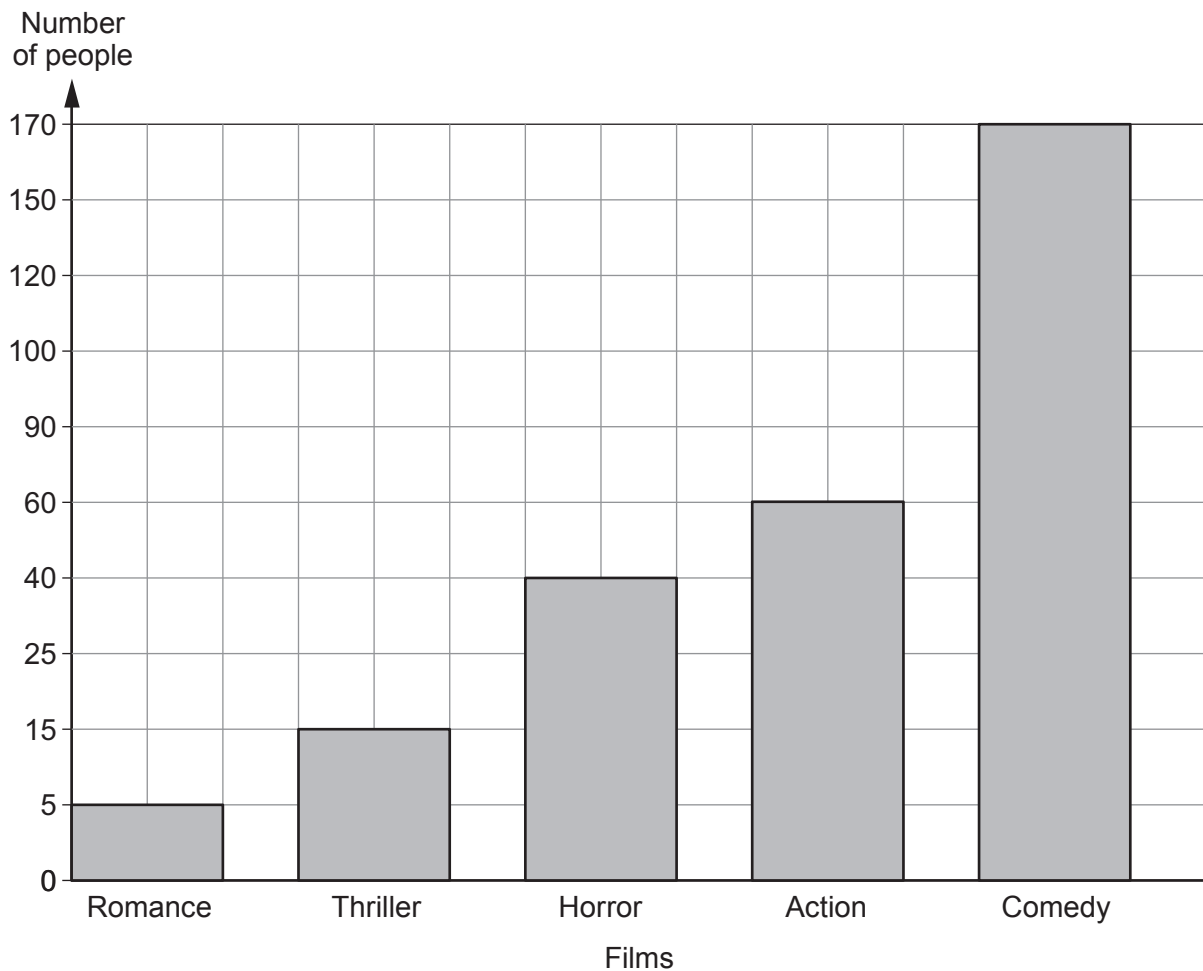


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1. (a) In a magazine, Owen saw the following graph about the different types of film that people like.

He told his friend:

This graph shows that twice as many people like comedy films than action ones!



Owen's statement is incorrect.

What is wrong with the graph that has led Owen to make his statement?

[1]

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- (b) Owen asks 40 people which type of film they like. The choices are romance (R), thriller (T), horror (H), action (A) and comedy (C). His results are as follows:

C	C	A	A	T	H	R	H	R	T
H	C	T	C	T	C	H	C	A	A
C	H	H	C	A	T	R	C	C	T
T	R	C	T	H	T	H	C	R	R

Use the data to draw a suitable bar chart on the squared paper below.

[6]

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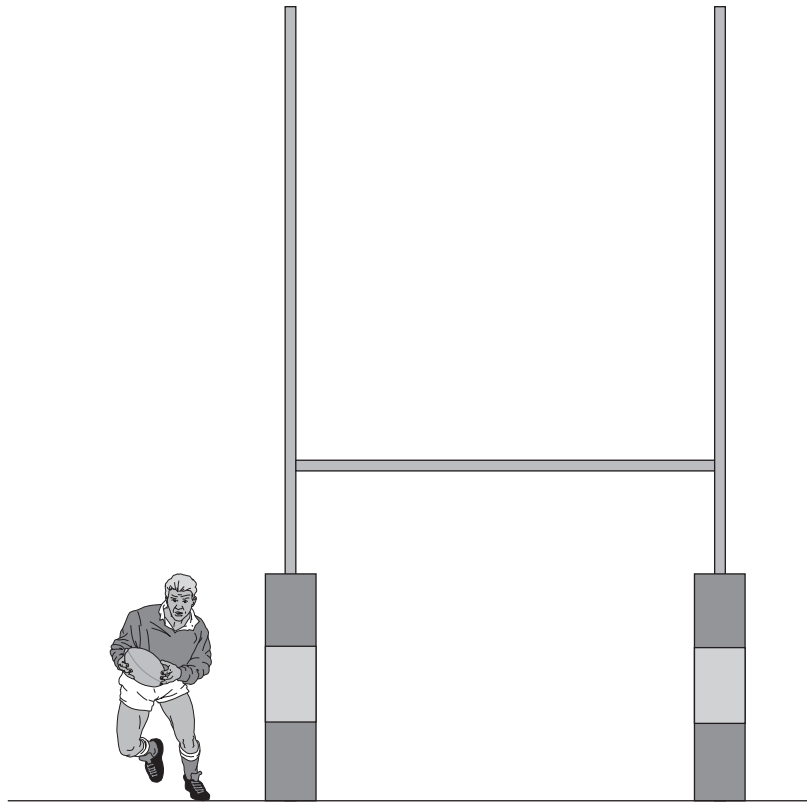


- (c) Complete the following sentence.

[1]

Owen's results show that the number of people who liked is
twice the number of people who liked

2. (a)



The picture above shows a rugby player next to a set of rugby posts.

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

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Write down an estimate for the **actual height** of the set of rugby posts.
You must show all your working.

[4]

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(b) In a local rugby club, the coach was asked about 4 different measurements.

Circle the appropriate quantity that you think the coach should give for each measurement.
[4]

Average length of a rugby ball	30 cm	30 m	30 km	30 mm
Average weight of a rugby ball	440 kg	440 mg	440 tonnes	440 g
Width of a rugby pitch	70 km	70 mm	70 m	70 cm
Area of a rugby pitch	8400 cm ²	8400 m ²	8400 mm ²	8400 km ²

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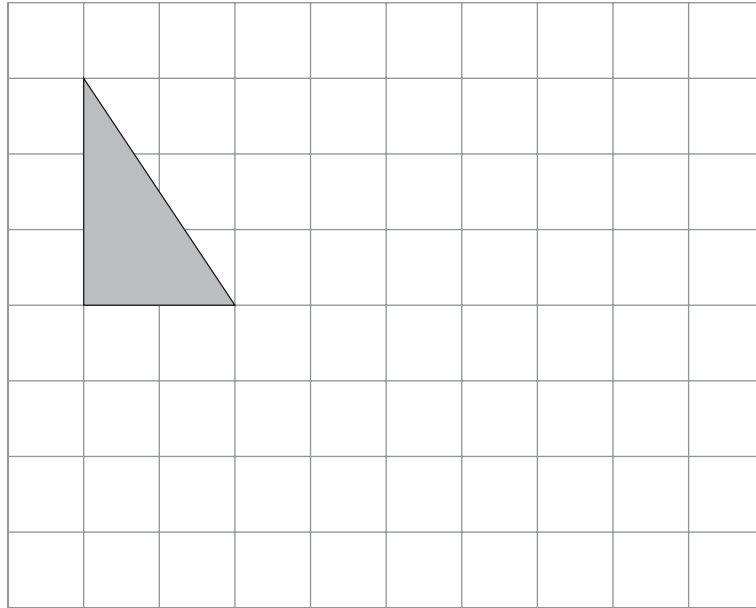
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3. Davinda has been asked to explain the difference between congruent and similar shapes.

- (a) Draw a shape that is congruent to the shape given below.
Write a sentence to explain what congruent shapes are.

[2]



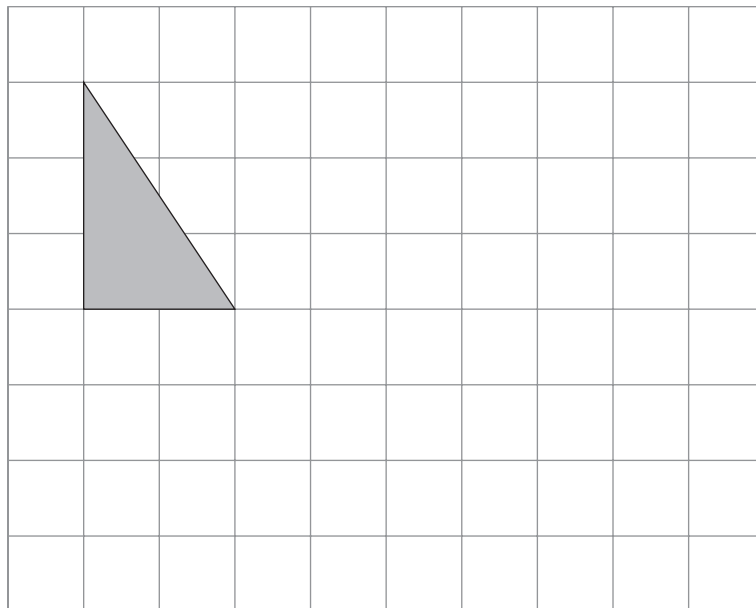
Explanation

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- (b) Draw a shape that is similar but not congruent to the shape given below.
Write a sentence to explain what similar shapes are.

[2]



Explanation

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4. Graham's Garage sells different car wheels.

(a) A selection of them is shown below.

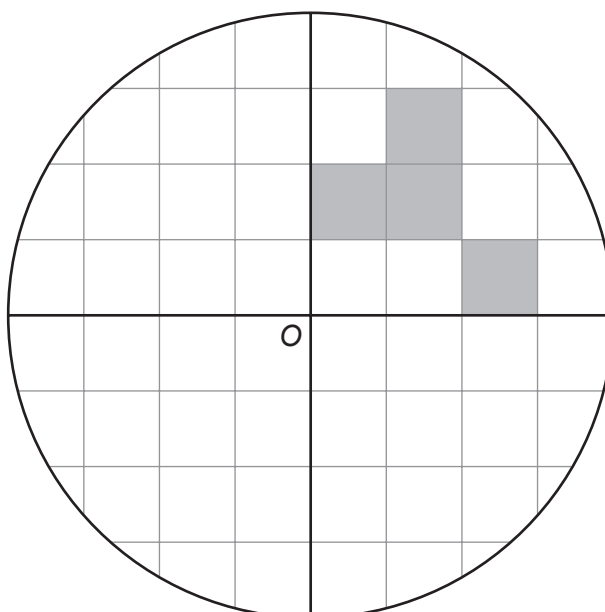


Graham notices that the wheels have rotational symmetry.
Complete the table stating the order of rotational symmetry for each of the wheels shown. [3]

Wheels	Wheel 1	Wheel 2	Wheel 3
Order of rotational symmetry			

(b) Graham wants to design a sign for his garage.

Shade 12 more squares on the diagram below so that the design has rotational symmetry of order 4 about the centre O. [3]



- (c) Graham gets 3 quotes from different companies for the cost of making the sign for his garage.
Each company charges £95 but offers different discounts.

The discounts are given below for each company.

Simon's Signs

Get
12% discount
off of all signs

Signs R Us

Discount
 $\frac{1}{10}$ off all prices

Signs & Symbols

We offer 15 pence off
every £1 spent

- (i) Calculate the discount that each company gives.
Write your answers in the table below.

Show all your working.

[4]

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	Simon's Signs	Signs R Us	Signs & Symbols
Actual discount	£	£	£

- (ii) Based on these quotes, which company should Graham choose to make his sign and why? [1]

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6. You will be assessed on the quality of your written communication in this question.

Liz wants a new smartphone.
She compares two offers.

Offer 1:

Her current mobile service provider has the following deal for the smartphone and contract that she wants.



No upfront cost

£39 a month

2000 5000 2
mins texts GB

**24 months
contract**

Offer 2:

Buy the handset from the Internet for £539 and
have a SIM card only deal from your mobile
service provider

Liz needs to have at least 2000 minutes and 5000 texts with only 2 GB of data allowance.

She finds out the following information on SIM card deals:

Monthly payment	Mins	Texts	Data
£10/month	1000	3000	500MB
£12.50/month	1500	5000	2GB
£12.50/month	2000	3000	2GB
£15/month	3000	5000	2GB
£20/month	3000	5000	3GB
£22.50/month	3000	unlimited	4GB

7. Jacob's teacher gives him the following homework task:

Write 2 equations that
have a solution of
 $x = 5$

Write 2 possible equations that Jacob could use in his homework.

[2]

Equation 1:

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Equation 2:

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2

8. A supermarket sells 500 g pots of natural yogurt for £1.50 each.

During the first week of April, the supermarket has a special offer on this yogurt.



Buy 1 pot and
get a 2nd pot
for half price!

Two weeks later, the price of the same 500 g pot of natural yogurt is still the same but the supermarket changes the offer to:

Buy 2 pots and
get a 3rd pot free!

Keenan always buys six 500 g pots of this natural yogurt for his restaurant.
Which would have been the better offer?
You must show all your working.

[5]

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9. Dennis plans to build a large toy box with a lid. A sketch of the toy box is shown below. It is in the shape of a cuboid.

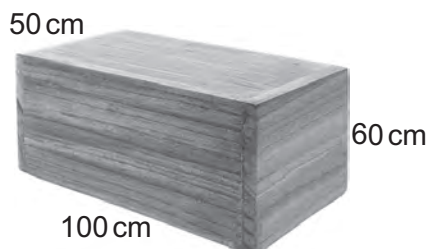


Diagram not drawn to scale

- (a) What is the volume of the toy box?
State the units of your answer.

[3]

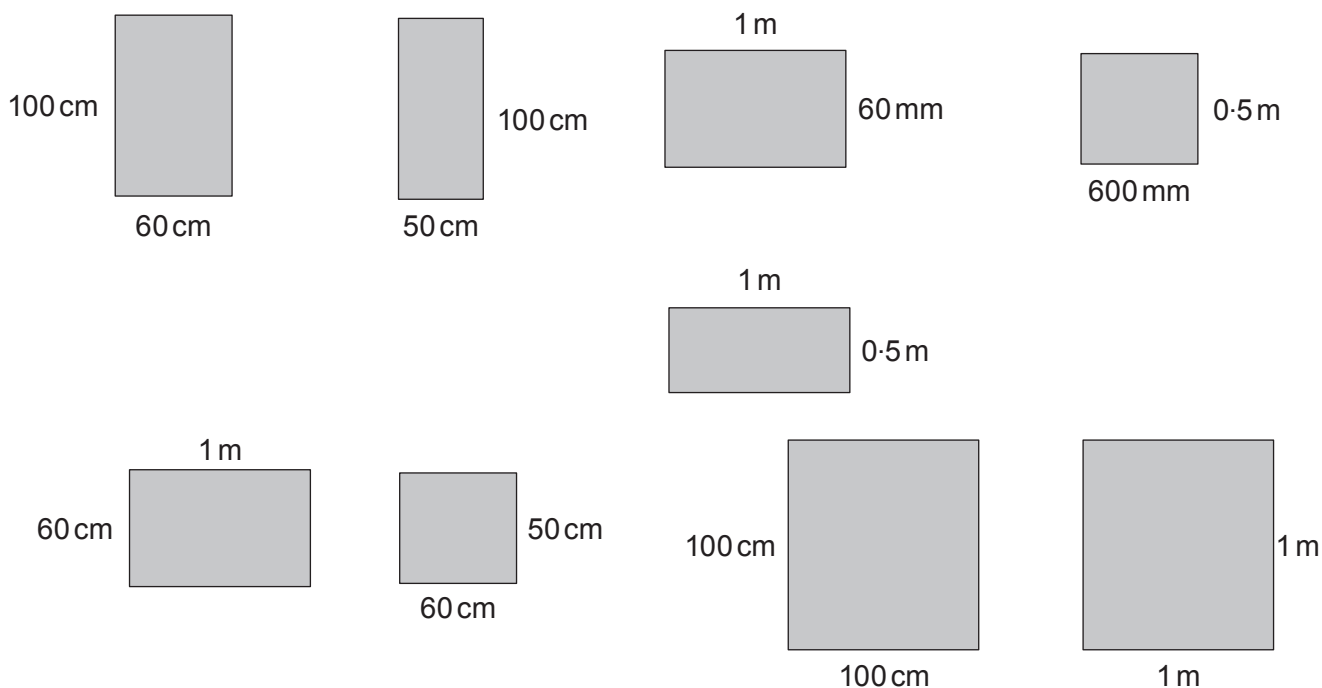
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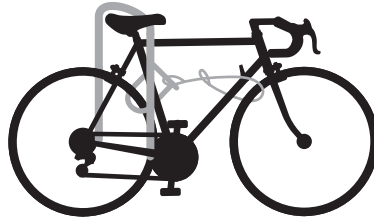
- (b) Dennis has some wooden panels ready to make the toy box. These are shown below. Tick each of the panels that Dennis will need to use to make the toy box.

[3]



Diagrams not drawn to scale

10. Approximately 1000 bikes are stolen every day across England and Wales.



AlliedWheels Insurance insists that insurance policy holders spend 9% of the value of their bike on purchasing two locks:

- a D-lock for the frame, and
- a flexible lock for the wheels.









Lili's bike is worth £349.

Her bike is insured by AlliedWheels Insurance.

Which two of the following locks should she buy to **exactly** satisfy her insurance company's conditions?

You must show all your working.

[3]

D-locks			
			
Lock 1 £16.34	Lock 2 £17.25	Lock 3 £14.67	Lock 4 £20.45
Flexible locks			
			
Lock 5 £12.34	Lock 6 £15.07	Lock 7 £6.45	Lock 8 £4.56

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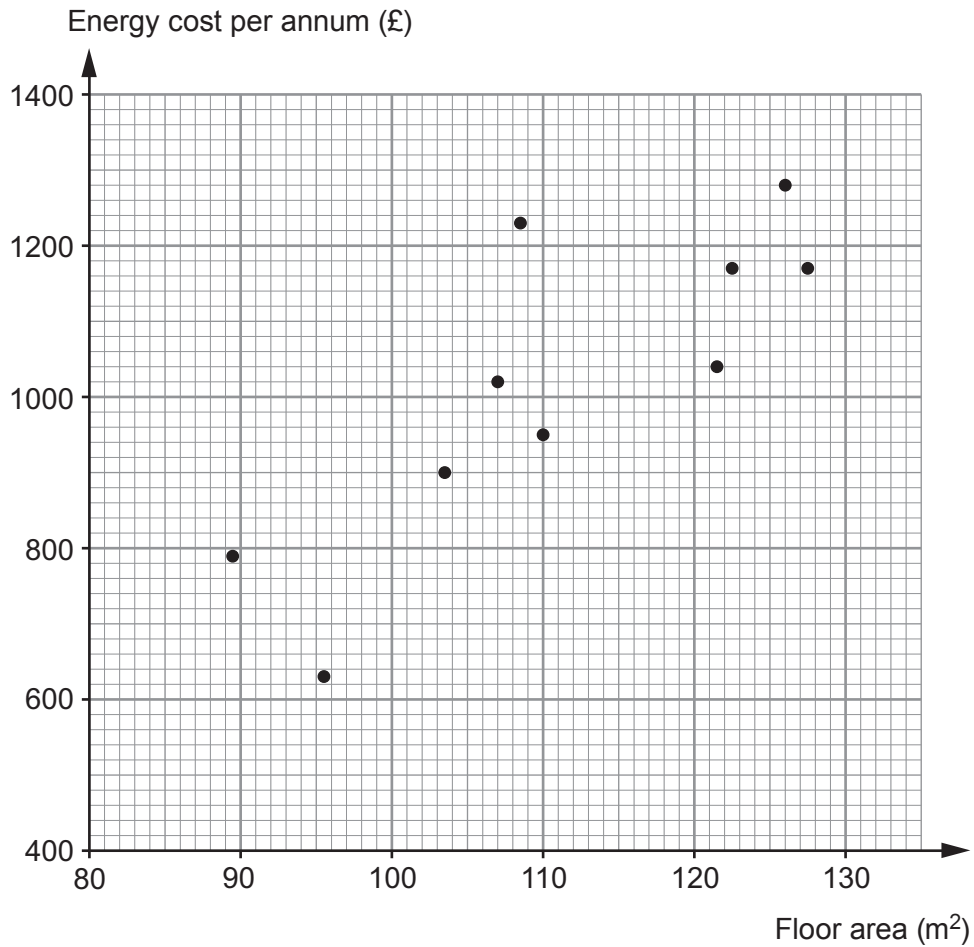
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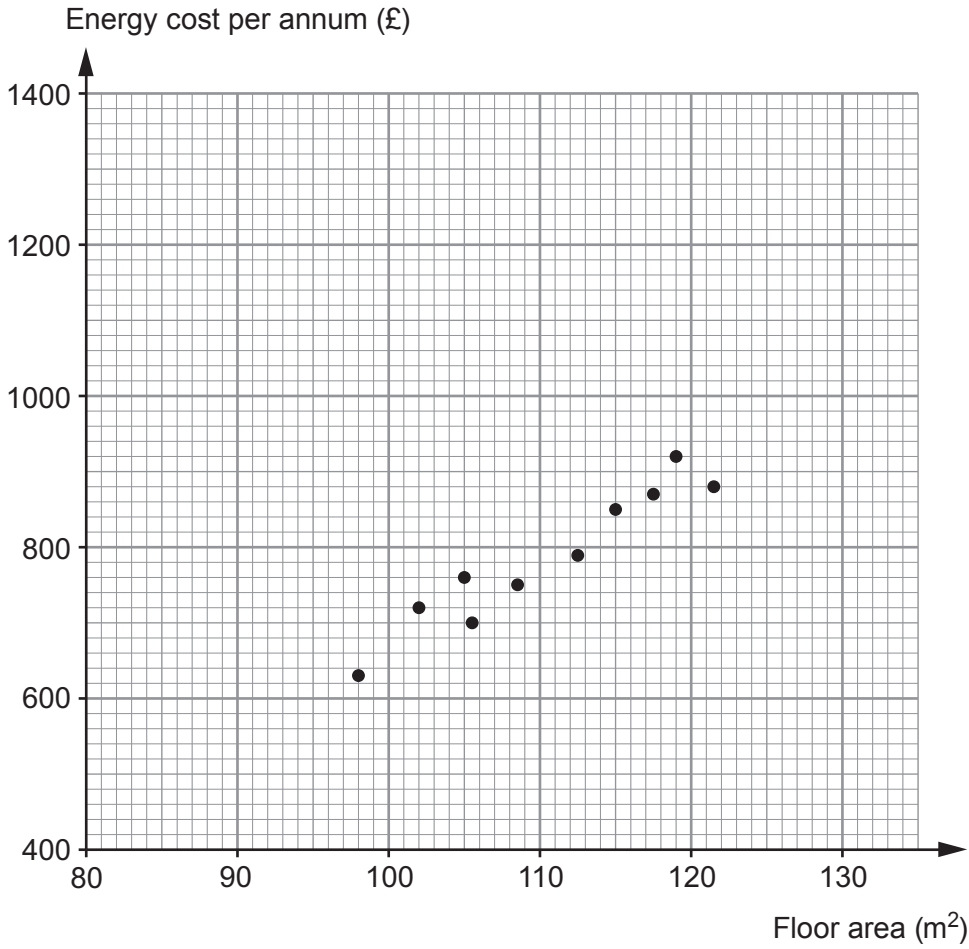
11. Rowena and Wilf each collected information about the floor area of a number of flats in different villages and the related energy cost per annum.

They each displayed their information in a scatter diagram.

Rowena's scatter diagram



Wilf's scatter diagram



(a) By considering the information collected by both Rowena and Wilf, what is the floor area of the flat with the highest energy cost? [1]

..... m²

(b) Who drew the scatter diagram showing the strongest correlation?

Rowena Wilf

You must give a reason for your answer. [1]

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(c) Draw, by eye, a line of best fit on Rowena's scatter diagram. [1]

- (d) *Heat-in* is a company that installs insulation.
Heat-in makes the following claim.

Make huge savings on your heating bills by insulating your flat.

Heat-in has insulated the flats in only one of these villages.
One of the scatter diagrams shows flats that have been insulated by *Heat-in*.

- (i) Whose scatter diagram is this more likely to be?
You must give a reason for your answer.

[1]

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- (ii) A newspaper headline says:

The smaller your flat, the more you save by insulating it.

From the information in the scatter diagrams, would you suggest this headline is possibly true or not?

You must give a reason for your answer.

[1]

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(b)

CAMPING AFON



Camping Afon is due to publish a summary about people and their camping holidays in their annual report. Five thousand *Camping Afon* customers are asked the 3 questions below.

<p>Camping questions</p> <ol style="list-style-type: none"> 1. How old are you? 2. Do you own a tent? 3. How many camping holidays have you had this year?

A data-collection sheet is to be used to collect the data.

- (i) Design a data-collection sheet that could be used to collect the customers' responses. You must plan to group the data as appropriate. [3]

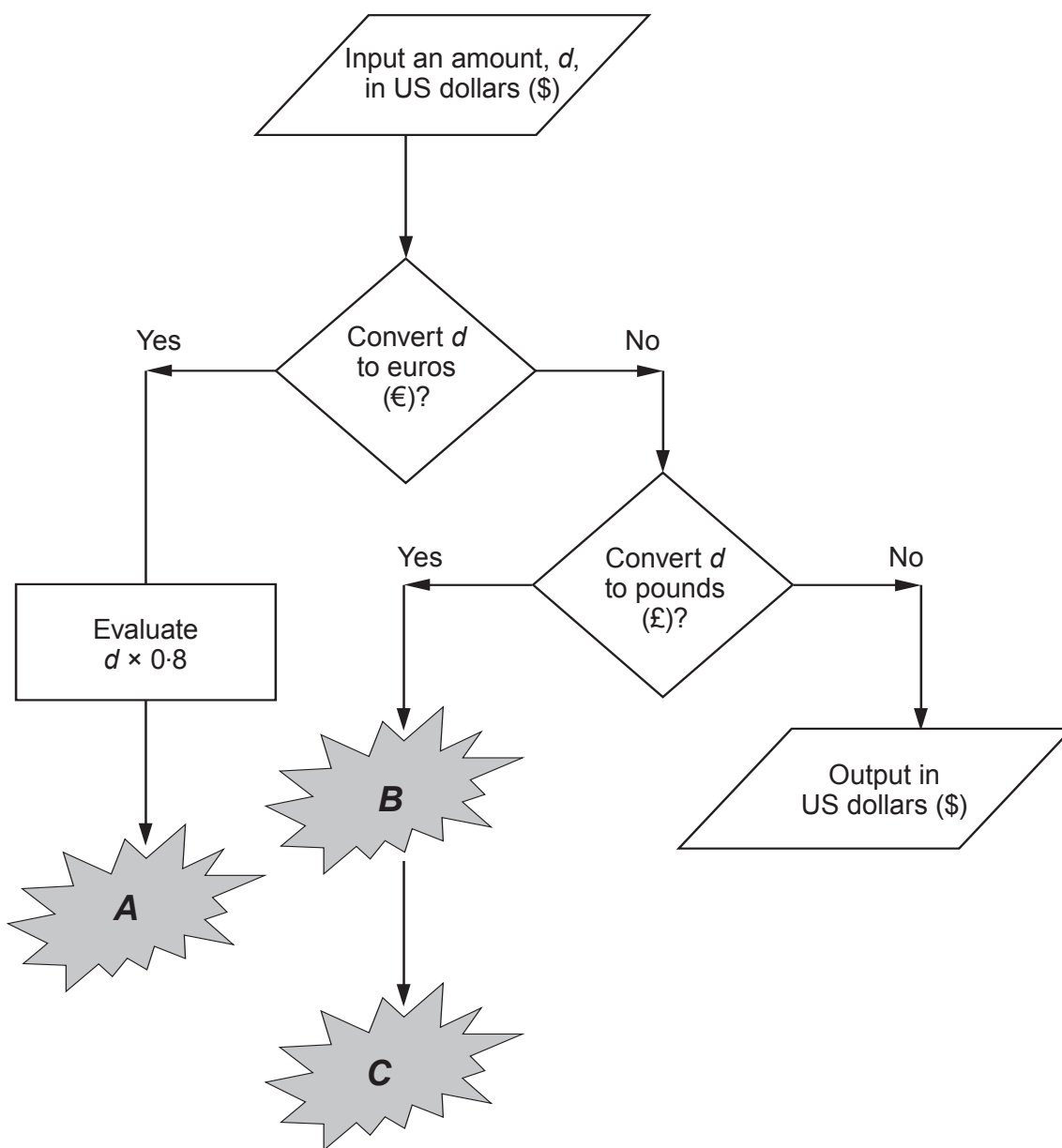
- (ii) Why is grouping data useful when collecting data? [1]

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13. The following is a section of a flowchart.



The exchange rates from US dollars (\$) to pounds (£) and euros (€) are

$$\begin{aligned} \$1 &= \text{£}0.62 \\ \$1 &= \text{€}0.80 \end{aligned}$$

(a) What would this section of a flowchart be used for?

[1]

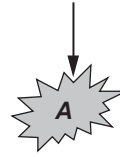
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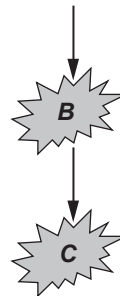
(b) There is a missing flowchart symbol indicated by



Draw the missing flowchart symbol and complete with an appropriate statement. [2]



(c) There are two missing flowchart symbols indicated by



Draw the two missing flowchart symbols and complete with appropriate statements. [3]



(d) Calculate the number of dollars that would be converted to €280. [2]

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END OF PAPER