| Surname | Centre Number | Candidate Number |
|---|---|---|
| Other Names | | 0 |

# GCSE LINKED PAIR PILOT

4362/01

W15-4362-01

# APPLICATIONS OF MATHEMATICS

## UNIT 2: Financial, Business and Other Applications

## FOUNDATION TIER

A.M. WEDNESDAY, 21 January 2015

1 hour 30 minutes

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

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### ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

### 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.

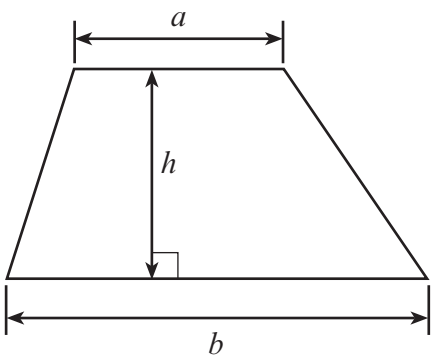
Scale drawing solutions will not be acceptable where you are asked to calculate.

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

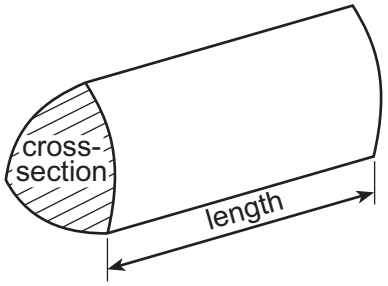
You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **5***(b)*.

## Formula List

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




**Volume of prism** = area of cross-section × length



Examiner only

**1.** Ahmed, Bethan, Caroline and Doug are playing a game with the ten cards shown below.

| 1 | 2 | 5 | 6 | 8 | 9 | 16 | 17 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|

Each player picks up two of the cards.
No card is shared by any of the players.

The numbers on:

- Ahmed's cards add up to 25
- Bethan's cards multiply to give 54
- Caroline's cards divide to give 9
- Doug's cards subtract to give 11.

Work out which cards each person has. [4]

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The numbers on:

Ahmed's cards are ..... and .....

Bethan's cards are ..... and .....

Caroline's cards are ..... and .....

Doug's cards are ..... and .....

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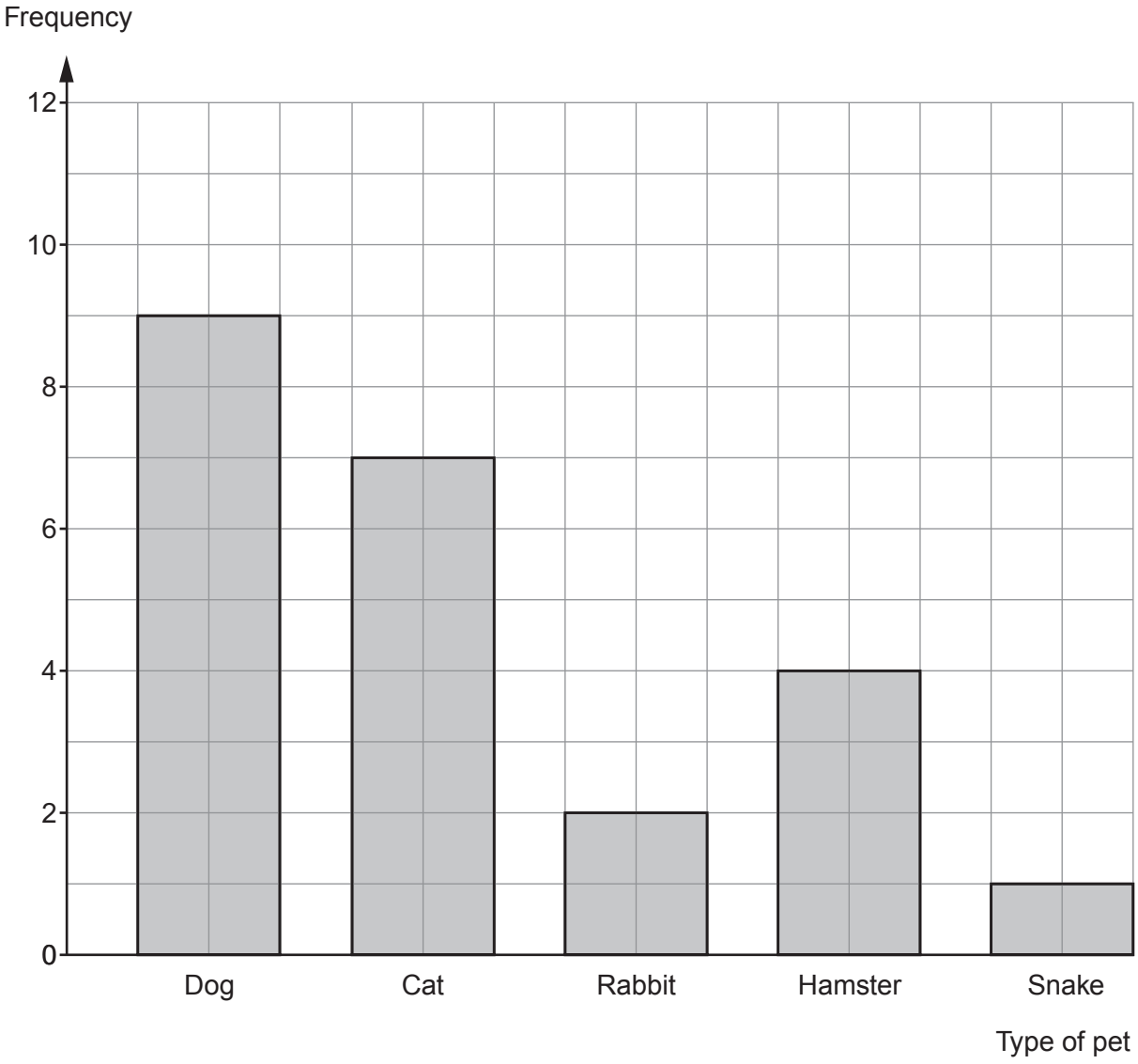
**Turn over.**

Examiner only

**2.** *(a)* The bar chart below shows the pets that a vet examined in one morning.




(i) How many cats did the vet examine? [1]

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(ii) How many pets did the vet examine in total? [2]

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(iii) Which type of pet was examined most often? [1]

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Examiner only

(iv) The vet wishes to display the information on the previous page as a pictogram. In the space below, draw a pictogram to represent the number of each type of pet the vet examined that morning. [4]

Key:



8





**Turn over.**

Examiner only

*(b)* Mrs Harris cannot drive and needs to take her dog, Spot, to the vet's surgery.
She catches a bus at 9:35 a.m. and gets off the bus outside the surgery at 10:22 a.m.
How long did the bus journey take? [1]

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*(c)* After seeing the vet, Mrs Harris needs to go to *Pets R Us* to buy supplies for Spot.
She decides to use a taxi company.
The diagram shows the roads and distances between the surgery and *Pets R Us*.

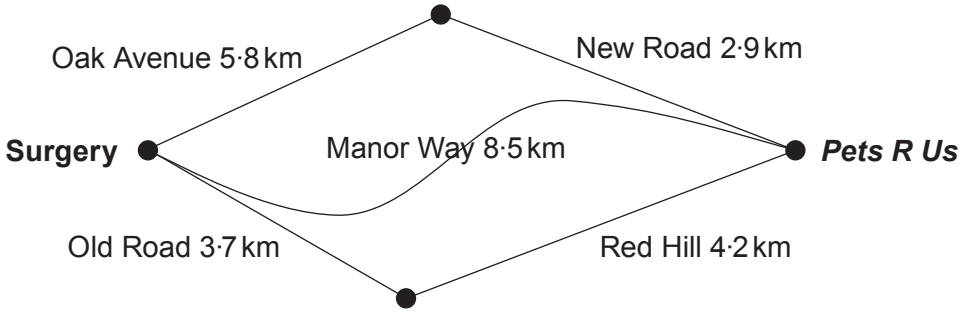


*Diagram not drawn to scale*

Mrs Harris asks the taxi driver to use the shortest route.
Work out the shortest route the taxi driver can use.
You must write down the route and its distance. [3]

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Examiner only

*(d)* At *Pets R Us* Mrs Harris buys pet supplies for Spot.
The cost of the goods are shown below.

|  |  |  |  |
|---|---|---|---|
| **Dog Basket £29.99** | **Flea Spray £5.99** | **Dog Treats £2.49** | **Large Dog Bowl £7.00** |

(i) Complete the bill for Mrs Harris. [4]

| Goods | Quantity | Cost |
|---|---|---|
| Dog Basket | 1 | £ |
| Flea Spray | 3 | £ |
| Dog Treats | 5 | £ |
| Large Dog Bowl | 1 | £7.00 |
| | **Total Cost** | £ |

(ii) Mrs Harris has a store discount card for *Pets R Us* which entitles her to a 5% discount.
How much discount does Mrs Harris receive?
Give your answer correct to the nearest penny. [3]

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*(e)* When Mrs Harris arrives home she tells Mr Harris about an offer she saw for a new dog collar for Spot in *Pets R Us*.
She says the offer was:

Buy a 40 metre dog collar for £10.99

What do you think is wrong with what Mrs Harris said to Mr Harris? [1]

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**Turn over.**

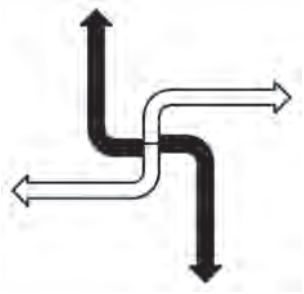
Examiner only

**3.** Sarah and Matthew decide to wallpaper some of the rooms in their new home. They look at a variety of designs and notice that they contain different shapes.

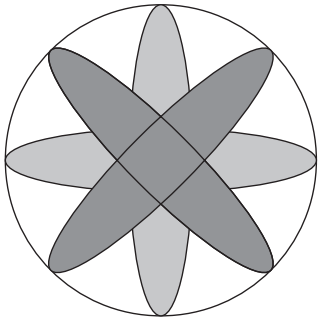
*(a)* Some of the designs they like are shown below.

**A**

**B**



**C**



**D**

(i) In the table below, write down the order of rotational symmetry of each of the above designs. [3]

| Shape | **A** | **B** | **C** | **D** |
|---|---|---|---|---|
| Order of rotational symmetry | | | | |

(ii) Sarah believes that all the designs have at least one line of symmetry.
Is Sarah correct?
Give a reason for your answer. [1]

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(iii) Which design has 4 lines of symmetry? [1]

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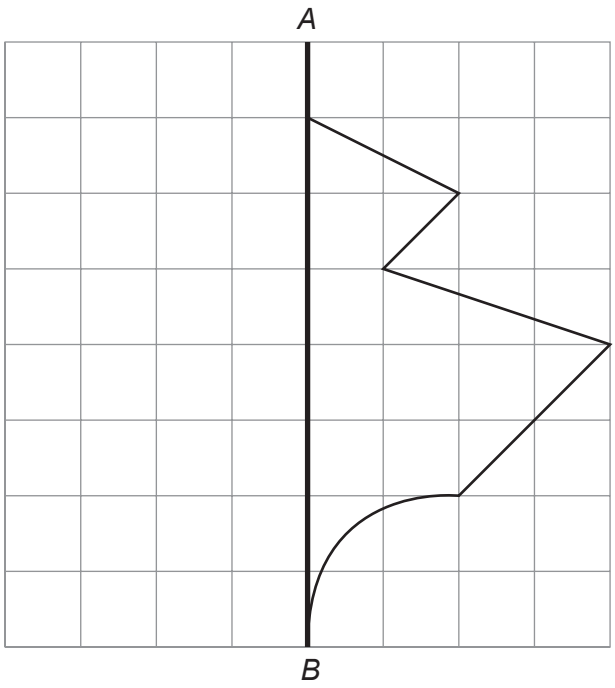
Examiner only

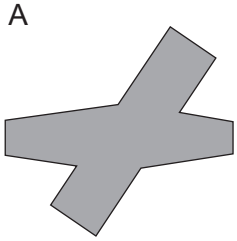
*(b)* Sarah decided to start a design of her own.
Complete Sarah's design using *AB* as the line of symmetry. [2]



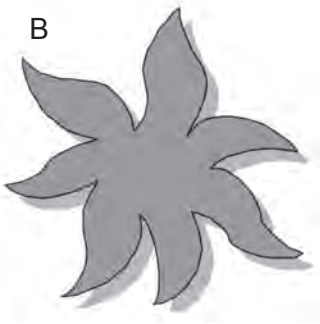
Examiner only

*(c)* On one wall, Sarah and Matthew wanted to have stencils of different shapes. Below is a selection of shapes that they looked at.

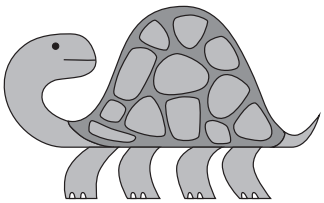
A



B

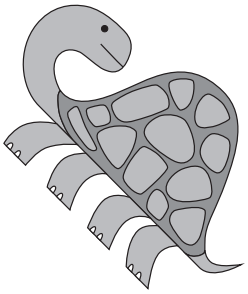


C



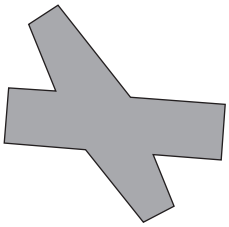
D

E



F

G



H

They noticed that some of the shapes were congruent and some were similar. Select 6 shapes to complete the following statements. [3]

Shape ..... is **congruent** to shape .....

Shape ..... is **congruent** to shape .....

Shape ..... is **similar** to shape .....

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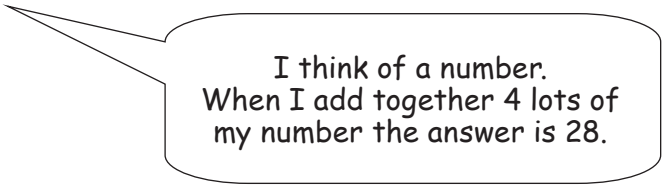
Examiner only

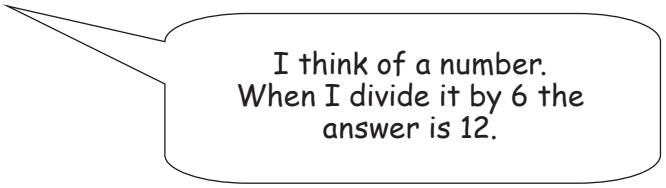
**4.** Megan and Ellis play a game called "I think of a number".

*(a)* Megan says




Set up an equation, using the information that Megan has given.
Use the letter $n$ for the number that Megan thought of.
Solve your equation to find the value of $n$. [2]

*(b)* Ellis says




Set up an equation, using the information that Ellis has given.
Use the letter $m$ for the number that Ellis thought of.
Solve your equation to find the value of $m$. [2]

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**Turn over.**

Examiner only

**5.** Catrin sees an advertisement on the Internet, shown below, for the racing bike she wants to buy.

The Internet company offers a discount of $\frac{1}{10}$ off the price shown.


*(a)* Calculate the discounted price of the racing bike. [2]

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

Catrin decides that she will buy a racing bike from her local bike shop instead.
The bike she wants to buy costs £925.

She has saved £470 towards the cost of buying this racing bike.

Catrin earns £600 per week.
She is able to save 20% of the amount she earns each week.

How many weeks will it take Catrin to save for the racing bike?
You must show all your working. [7]

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Examiner only

**6.** The diagram below shows the pattern of tiles on a kitchen wall.

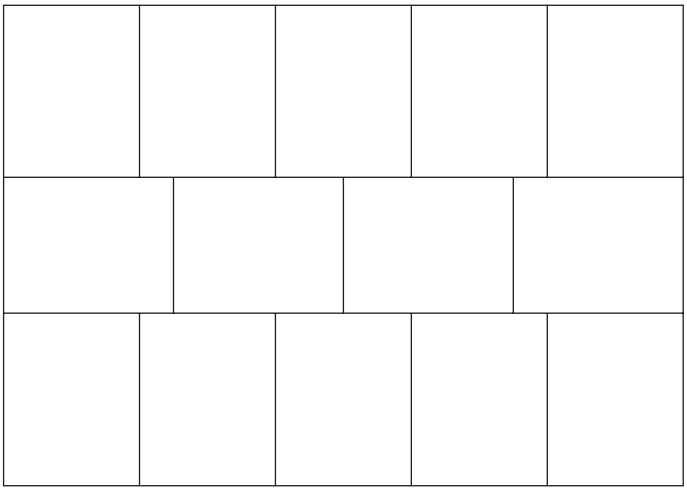

*Diagram not drawn to scale*

Each tile in the pattern is exactly the same.
Each tile has a width of 12 cm.

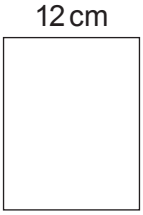


*Diagram not drawn to scale*

Find the total area of these tiles on the kitchen wall. [5]

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Examiner only

**7.** Lloyd has been given 2 identical boxes, each in the shape of a cuboid, to store his collection of toy cars.

Each cuboid has length 50 cm, width 30 cm and height 40 cm.

*(a)* Find the total volume of the 2 boxes. [3]

*(b)* Lloyd has another box with a volume of 140 000 $cm^3$.

$1cm^3 = 1\,ml$

$1000ml = 1$ litre

Change 140 000 $cm^3$ into litres. [2]

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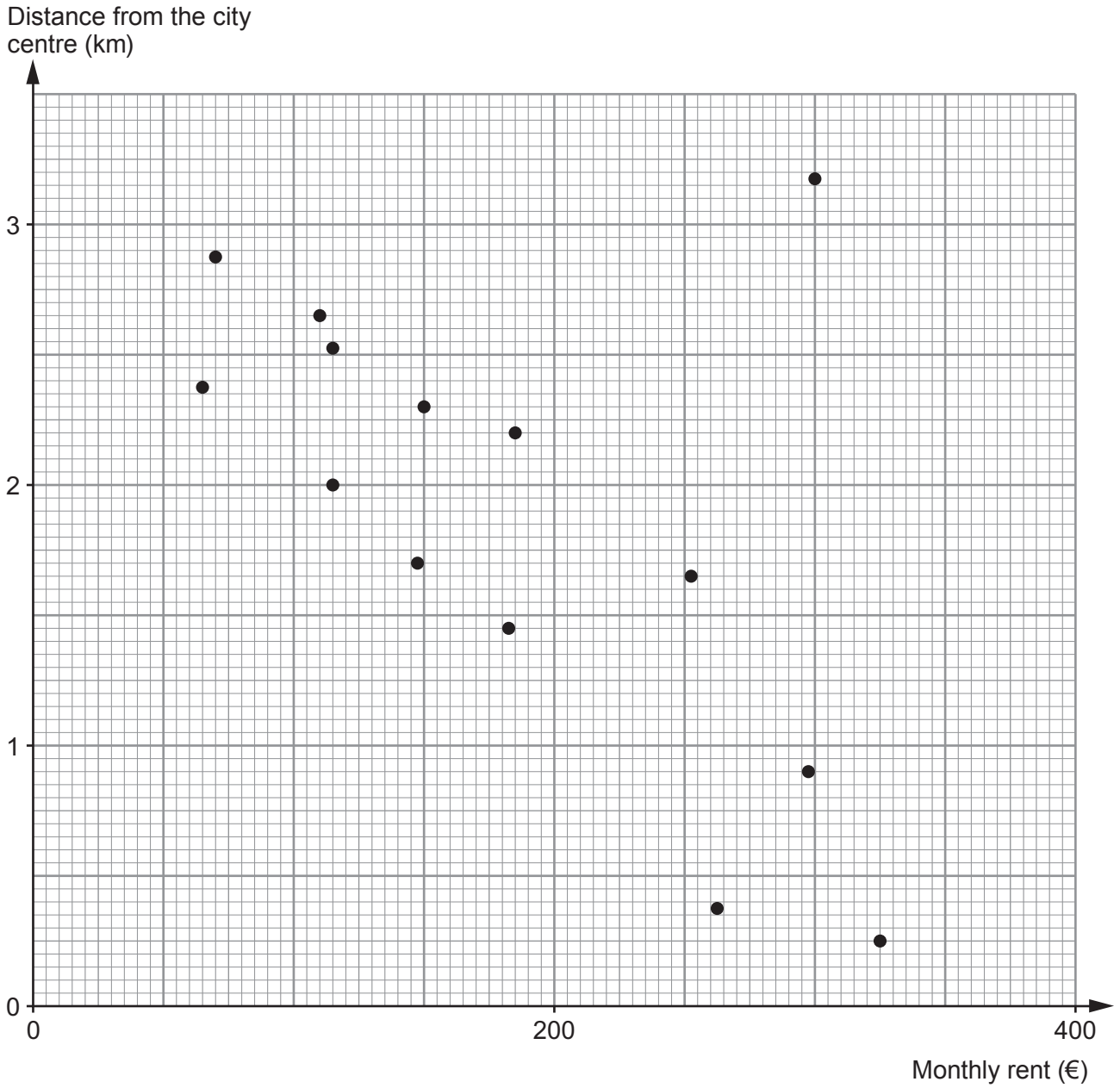
Examiner only

**8.** The scatter diagram displays data for furnished, two-bedroom apartments in a European city. It shows the monthly rental cost and the distance the apartment is from the city centre.




*(a)* How much is the monthly rental cost for the most expensive apartment? [1]

..... €

*(b)* How much is the monthly rental cost for the apartment furthest away from the city centre? [1]

..... €

Examiner only

*(c)* One of the apartments represented on the scatter diagram is a luxury apartment with electronic sound systems and computerised equipment.
Can you tell with certainty, from the scatter diagram, which is the luxury apartment?
You must give a reason for your answer. [1]

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*(d)* Draw, by eye, a line of best fit on the scatter diagram. [1]

*(e)* Use your line of best fit to estimate the monthly rental cost for a furnished, two-bedroom apartment 1·25 km from the city centre. [1]

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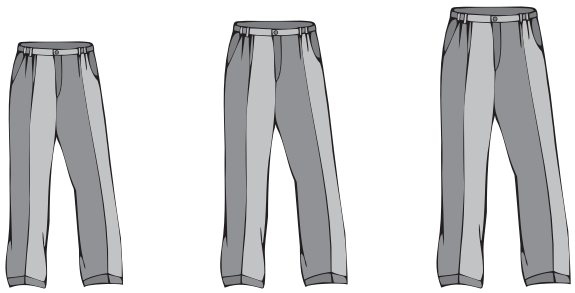
**Turn over.**

Examiner only

**9.** Men's trousers can be bought in different sizes: small, medium and large.



The chart below gives measurements for the different sizes of trousers.

| Waist measurement, in centimetres correct to the nearest cm | Waist measurement, converted into inches correct to the nearest inch | Size |
|---|---|---|
| 66 cm to 74 cm | 26 inches to ..... inches | Small |
| 75 cm to 90 cm | ..... inches to 35 inches | Medium |
| 91 cm to ..... cm | 36 inches to 49 inches | Large |

1 inch is approximately 2·54 cm

*(a)* Fill in the missing values in the table above. [3]

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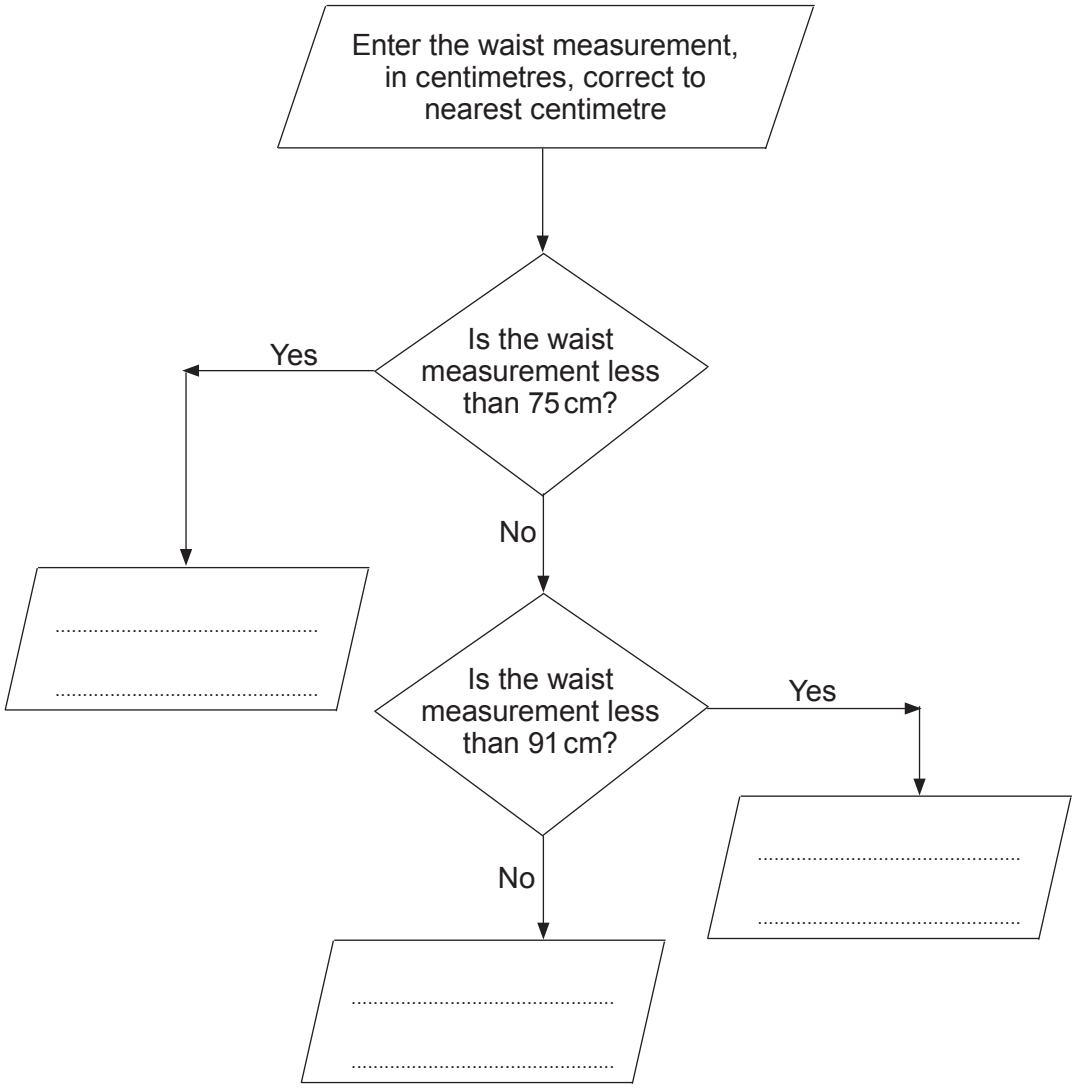
Examiner only

*(b)* The following section of a flowchart is used to find which size trousers to buy.




Complete the three empty output boxes in the flowchart above. [2]

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**Turn over.**

Examiner only

**10.** Dewi is going on holiday to China.

He has found the following rates for exchanging pounds sterling (£) and Chinese yuan (CYN), at a local exchange bureau.

| | |
|---|---|
| Buying Chinese yuan (CYN) | £1 buys 9.28 CYN |
| Selling Chinese yuan (CYN) | 9.42 CYN buys £1 |

The exchange bureau has all the possible sterling coins and notes.
Dewi knows that the exchange bureau only sells and buys CYN notes and that no coins are available or accepted.

The bureau has many of the following CYN notes.


*(a)* Dewi has £460 to buy Chinese yuan.

Calculate
- the maximum number of CYN Dewi can buy, and
- how much, to the nearest penny, this will cost him.

You must show all your working. [5]

Examiner only

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*(b)* It would cost Dewi £100 to buy 928 CYN.
Dewi states that he will lose money when he changes any CYN notes that he buys back into pounds.
How much would Dewi lose in changing 928 CYN back into pounds? [3]

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**Turn over.**

Examiner only

**11.** Tommy plays maths games on his computer.
He keeps a record of his scores for each of *AddU*, *High5s* and *Tri-angle* in a spreadsheet.
The maximum scores are shown in the section of Tommy's spreadsheet shown below.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| **1** | **Maths game** | **Maximum score for each game** | **Game 1** | **Game 2** | **Game 3** | **Game 4** | **Total score** | **Total score as a percentage** |
| **2** | *AddU* | 20 | 12 | 10 | 6 | 14 | 42 | 52·5 |
| **3** | *High5s* | 4 | 4 | 3 | 3 | 2 | 12 | 75·0 |
| **4** | *Tri-angle* | 10 | 6 | 4 | 7 | 6 | 23 | 57·5 |

Write down a formula that could be used in the spreadsheet to calculate the entries for the following cells. [5]

**G2**

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**H2**

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**END OF PAPER**

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