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



GCSE LINKED PAIR PILOT

4362/01



W16-4362-01

APPLICATIONS OF MATHEMATICS

UNIT 2: Financial, Business and Other Applications

FOUNDATION TIER

A.M. WEDNESDAY, 20 January 2016

1 hour 30 minutes

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

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 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.

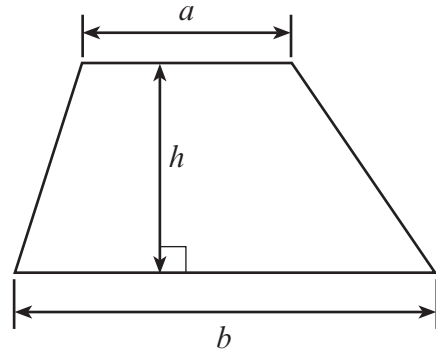
Scale drawing solutions will not be acceptable where you are asked to calculate.

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 7.

Formula List

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



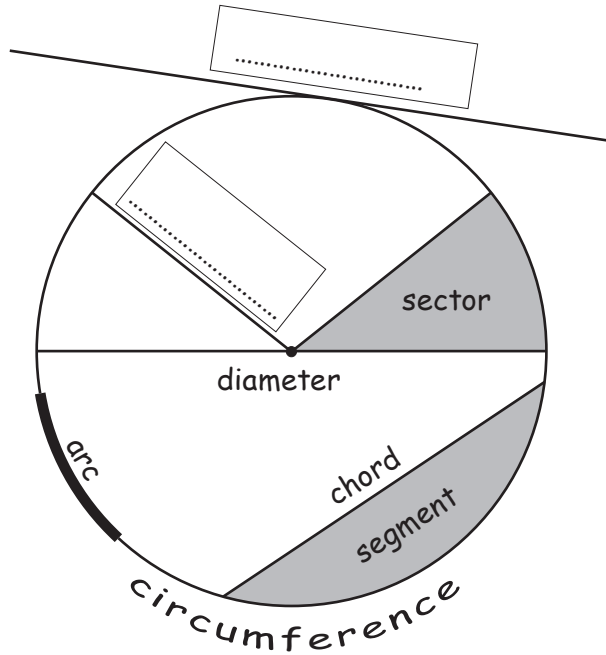
Volume of prism = area of cross-section \times length



1. A printing company is designing an information leaflet about the parts of a circle. Most of the parts of the circle have been labelled. Two lines have not yet been named.

(a) Complete the information leaflet for the printing company.

[2]



- (b) The designer of the information leaflet notices that there is a relationship between two straight lines in the circle. Complete the statement for the designer.

[1]

The is twice the length of the

- (c) Tommy, who works at the printing company, is unsure of the difference between a chord and a segment. Explain fully the difference between a chord and a segment of a circle.

[2]

Chord

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Segment

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2. Shakoor is asked to conduct a survey about the colour of mobile phone covers.

(a) Shakoor believes that the main colours are black, white, pink and blue.

Design a data collection sheet that Shakoor could use to collect the data.

[3]

(b) Give one disadvantage of Shakoor using the data collection sheet.

[1]

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3. Tick (✓) a box to show whether each statement is **true** or **false**.

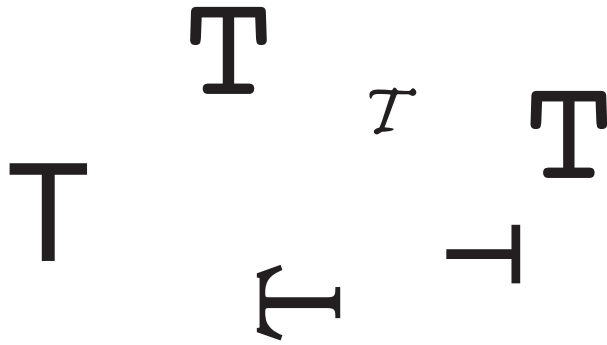
[3]

| | True | False |
|---|--------------------------|--------------------------|
| A suitable length for a football pitch is 100 cm. | <input type="checkbox"/> | <input type="checkbox"/> |
| The weight of a small bag of crisps is approximately 35 grams. | <input type="checkbox"/> | <input type="checkbox"/> |
| The amount of orange juice in a carton could be 1 litre. | <input type="checkbox"/> | <input type="checkbox"/> |
| The typical area of a bedroom floor is 12 square km. | <input type="checkbox"/> | <input type="checkbox"/> |
| The average speed of a person walking along the coastal path in Wales could be between 30 and 40 km/hour. | <input type="checkbox"/> | <input type="checkbox"/> |

4. (a) Some of the letters below are in the same font.

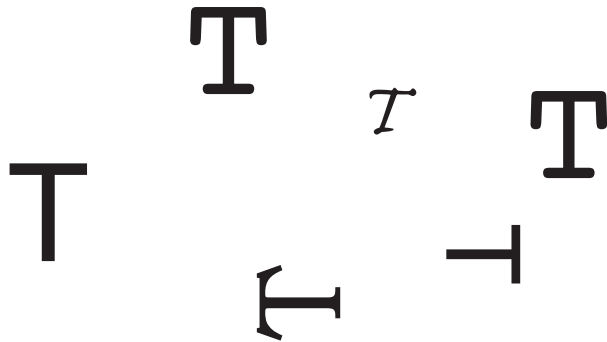
(i) Circle the letters that are similar but not congruent.

[1]



(ii) Circle the letters that are congruent.

[1]



(b) Letters using different fonts are shown below.

B **W** **F** **Q**
I **H** **Z**

Write the letters in the correct boxes.

[4]

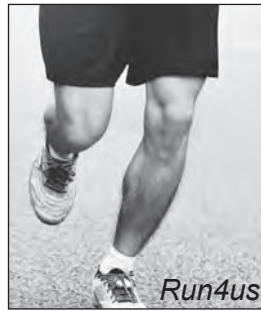
| | Rotational symmetry | No rotational symmetry |
|------------------------|---------------------|------------------------|
| Reflection symmetry | | |
| No reflection symmetry | | |

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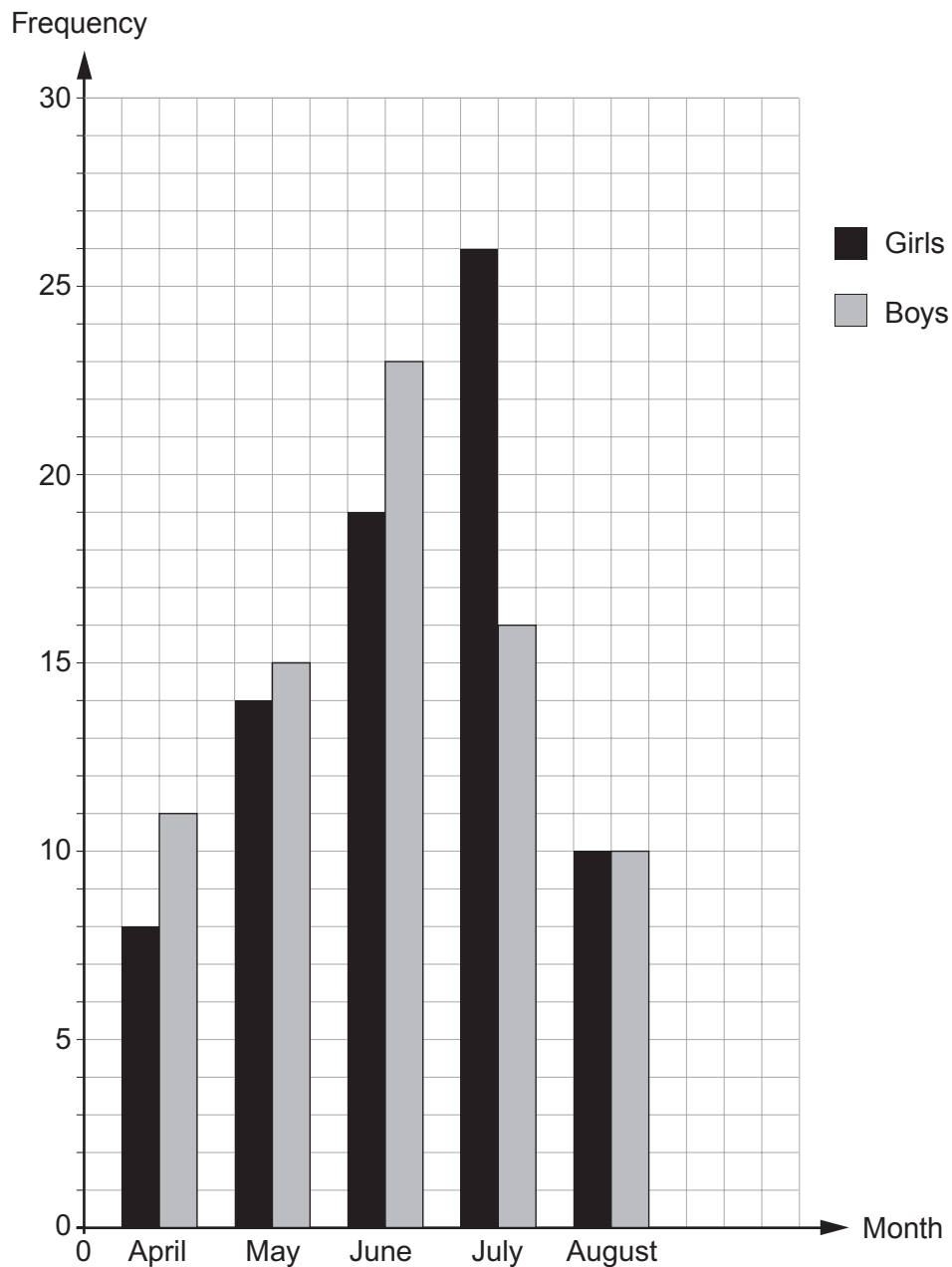
6

5.



A local running club, *Run4us*, organised a race for children once every month from April to September.

The bar chart shows the numbers of girls and boys who took part in the races for each of the months from April to August.



(a) How many boys took part in the race in June? [1]

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(b) In which month did the lowest number of girls take part in the race? [1]

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(c) Two of the months had the same number of children taking part in the race. What were the two months? [2]

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..... and

(d) One of the children, James, says:
"There are more boys than girls taking part in the races as more of the bars for the boys are higher than those for the girls."

Is James correct? You must show your working. [2]

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(e) There are 36 girls and 33 boys in the running club.
In September, the running club had their final race of the season.
 $\frac{3}{4}$ of the girls and $\frac{1}{3}$ of the boys took part in the race.
Complete the bar chart for September. [5]

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6. Alison has been studying algebra.
She has been setting up and solving equations and inequalities.
She has 2 questions to complete as part of her homework.

Set up and solve each of the following for Alison.

- (a) 7 times a number n is the same as 28. [2]

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- (b) 6 plus a number c is less than 15. [2]

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| 4 |

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



When planning a holiday to Barcelona, the Carson family are considering taking an open top bus tour of the city.

The Carson family look on the internet in order to compare prices. They find 2 different bus companies: *Barcelona Bus Turística* and *Barcelona City Tour*. For both companies, tickets can be bought for either one day or two days.

Children pay a reduced price if they are between the ages of 4 and 12 years. Children under the age of 4 travel for free.

The ticket prices for *Barcelona Bus Turística* are given in pounds (£). The ticket prices for *Barcelona City Tour* are given in euros (€).

The costs are advertised as follows:

Barcelona Bus Turística

| <u>One-day ticket</u> | |
|-----------------------|--------|
| Adults | £23.50 |
| Child | £14 |
| <u>Two-day ticket</u> | |
| Adults | £30.50 |
| Child | £17.50 |

Barcelona City Tour

| | |
|-----------|-----|
| Adults: | |
| 1 Day | €27 |
| 2 Day | €35 |
| Children: | |
| 1 Day | €16 |
| 2 Day | €20 |

The Carson family consists of Mr and Mrs Carson, Owen who is 10 years old and Alys who is 3 years old.

They decide to buy tickets for two days.

The exchange rate on the day the Carson family are looking at the prices is £1 = €1.24.

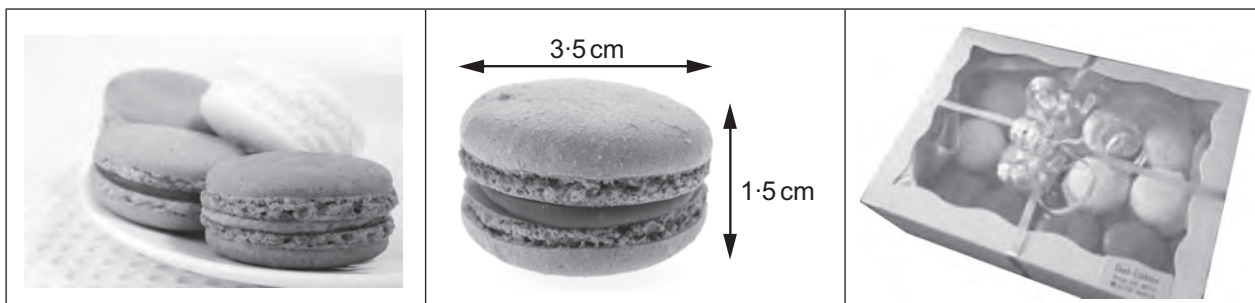
Which bus company works out to be the cheaper for the Carson family?
State by how much it is cheaper, giving your answer in euros.
Show all your working.

[9]

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8.



A macaroon is a small circular cake.

Sometimes macaroons are placed in layers so that they lie flat within a box, as shown in the picture above.

Macaroons, each with a diameter of 3.5 cm and a depth of 1.5 cm, are placed in a new box.

The box, shown below, is in the shape of a cuboid.

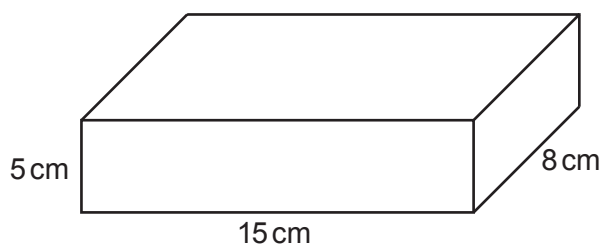


Diagram not drawn to scale

- (a) A plastic sheet is placed between each layer of macaroons. The plastic sheet has a depth of 1 cm.

How many macaroons can fit into the box?

[5]

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- (b) Calculate the volume of the box.
Write down the units of your answer.

[3]

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- (c)



- (i) Cedric buys a box of macaroons as a birthday present for a friend. He decides to wrap the box in a ribbon with a bow on top, as shown in the diagram above. Cedric has either pink or green ribbon to choose from. He has 80 cm of pink ribbon and 90 cm of green ribbon. He must have enough ribbon to have a 20 cm bow on top of the box. Could Cedric use either colour of ribbon? Give a reason for your answer. Show all your working.

[3]

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- (ii) A roll of ribbon costs £6 for 300 cm. How much does the length of ribbon that Cedric uses to wrap the box cost?

[2]

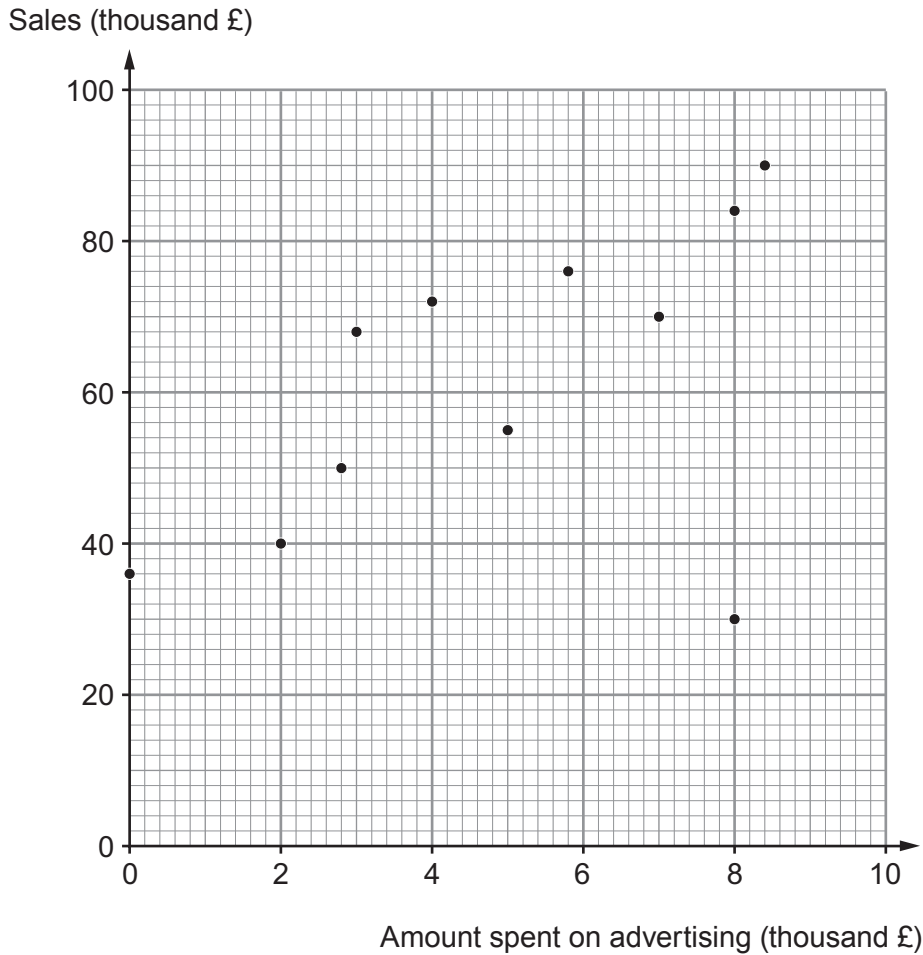
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9. Many shampoo companies spend money on advertising. Rita has asked 11 companies to tell her the **amount spent on advertising (thousand £)** and the **sales (thousand £)** for their shampoo during the previous month.

She has displayed her findings in a scatter diagram, shown below.



- (a) One company did not spend on advertising. What is the sales figure for this company? [1]

- (b) One company was very disappointed with their sales figure, given the amount that they spent on advertising. Which company do you think this might be? Indicate your answer on the scatter diagram and write down the amount they spent on advertising and their sales figure. [2]

Amount spent on advertising =

Sales figure =

(c) Ignoring the point you indicated in (b), draw a line of best fit for the other points on the scatter diagram. [1]

(d) For a typical company selling shampoo, complete the following sentence.

For every £1 spent on advertising, the company expects an additional
£..... in sales of shampoo.

You **must** show your calculation. [2]

Calculation for this answer:

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(e) Rita is investigating if it is worth spending money on advertising shampoo.

(i) What conclusion could she draw so far from her investigation? [1]

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(ii) What should Rita do to improve her investigation? [1]

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10. *Island Boots* sells pairs of boots online and through mail order.



(a) *Island Boots* keeps a spreadsheet to help track the sales of different sized boots.

A partially complete section of the spreadsheet is shown below.

| | A | B | C | D | E | F | G |
|---|---------------|---------|--------|--------|--------|--------|-------------------------|
| 1 | | | Sales | | | | |
| 2 | Boot style | Price £ | Size 5 | Size 6 | Size 7 | Size 8 | Total sales (£) |
| 3 | <i>Arabel</i> | 25.00 | 2 | 3 | 6 | 4 | 375 |
| 4 | <i>Carba</i> | 42.00 | 0 | 0 | 8 | 6 | ... |
| 5 | <i>Kata</i> | 32.50 | 1 | ... | 5 | 6 | 650 |
| 6 | <i>Yara</i> | 18.50 | ... | ... | 6 | 2 | 407 |
| 7 | | | | | | | Overall total sales (£) |
| 8 | | | | | | | |

(i) Complete the cells **G4** and **D5**. [2]

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(ii) The same number of size 5 *Yara* boots are sold as size 6 *Yara* boots. Complete cells **C6** and **D6**. [3]

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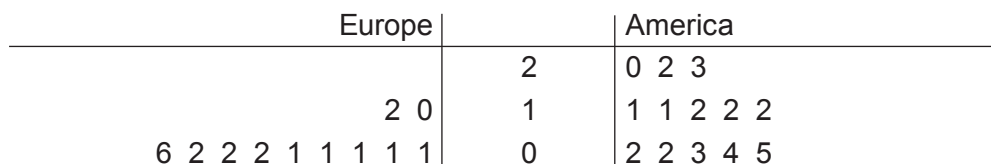
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(iii) Write down a formula that could be used to calculate the value in **G3**. [2]

G3 =

- (b) Yesterday, the manager recorded the number of pairs of boots that needed to be sent to different customers in Europe and America.
The stem-and-leaf diagram shows the information.

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Key:

| | | | |
|---|---|---|------------------------------|
| 2 | 2 | 3 | represents 23 pairs of boots |
| 2 | 1 | | represents 12 pairs of boots |

- (i) Complete the following table.

[3]

| | Median | Range | Mode |
|---------|--------|-------|------|
| Europe | | | |
| America | | | |

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- (ii) The manager of *Island Boots* says,

"Looking at the average sales, I think the boots sent to America are going to shops for selling to customers, but the boots sent to Europe are for customers buying for themselves."

Do you think the manager is definitely correct?
You must give a reason for your answer.

[1]

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11. Laces are made using a mix of 40% nylon and 60% polyester. A pair of laces, of length 60 cm, weighs 8 g and costs 80p.



Another pair of the same style of laces is of length 96 cm.

- (a) How much should a 96 cm pair of laces cost?

[3]

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- (b) How many grams of **nylon** are there in a 96 cm pair of laces?

[3]

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END OF PAPER

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| 6 |