

Centre Number						Candidate Number				
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Other Names										
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For Examiner's Use	
Examiner's Initials	
Pages	Mark
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TOTAL	



General Certificate of Secondary Education  
Foundation Tier  
November 2014

# Applications of Mathematics (Linked Pair)

93701F

**F**

## Unit 1 Finance and Statistics

Wednesday 5 November 2014 9.00 am to 10.30 am

<p><b>For this paper you must have:</b></p> <ul style="list-style-type: none"> <li>• a calculator</li> <li>• mathematical instruments.</li> </ul>	
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### Time allowed

- 1 hour 30 minutes

### Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  to be 3.14 unless another value is given in the question.

### Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80
- The quality of your written communication is specifically assessed in Questions 2, 13 and 14  
These questions are indicated with an asterisk (\*).
- You may ask for more answer paper, tracing paper and graph paper.  
These must be tagged securely to this answer book.
- You are expected to use a calculator where appropriate.

### Advice

- In all calculations, show clearly how you work out your answer.

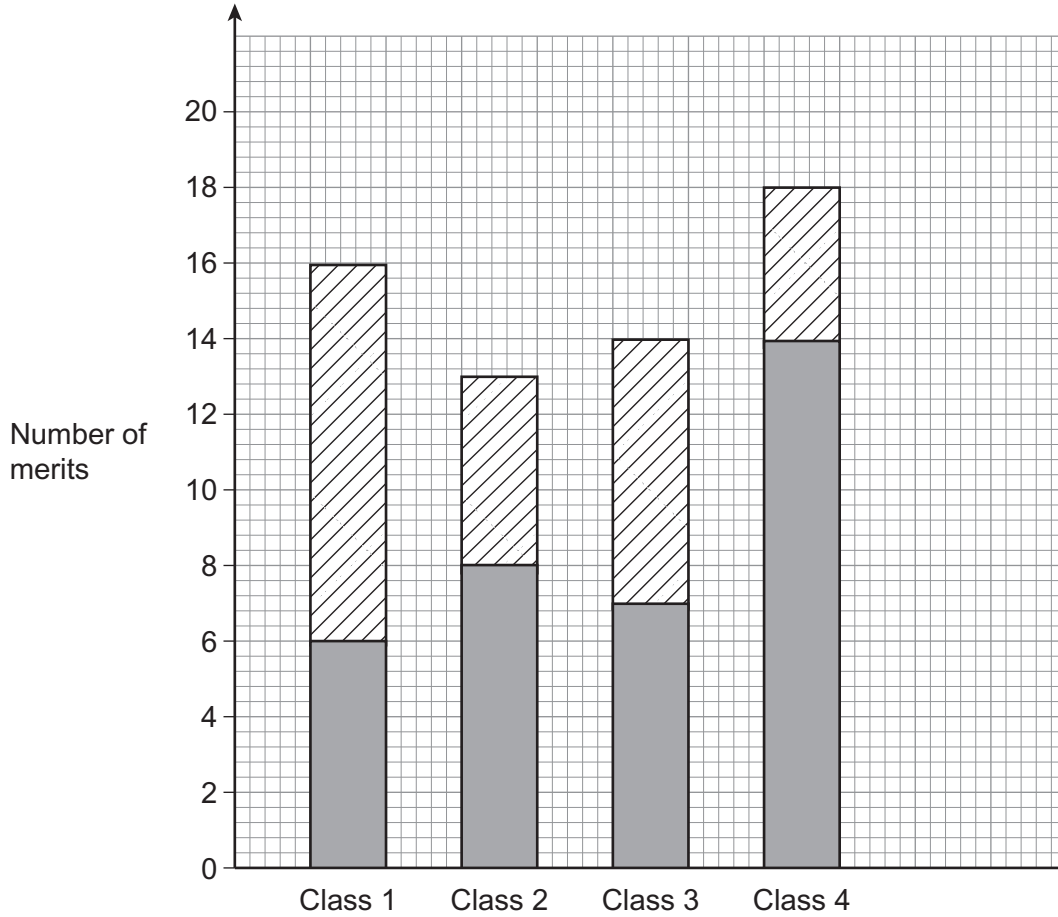


N 0 V 1 4 9 3 7 0 1 F 0 1

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

- 1 Merits are given to boys and girls at a primary school.  
The bar chart shows the number of merits given to four classes in one week.

■ = boys    ▨ = girls



1 (a) How many merits were given to **girls** in Class 2?

[1 mark]

Answer .....

1 (b) Work out the range of the number of merits given to **boys** in these four classes.

[2 marks]

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Answer .....

1 (c) In Class 4, how many **more** merits were given to boys than to girls?

[1 mark]

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Answer .....

1 (d) The children in Class 5 got a total of 19 merits.  
The girls got 7 **more** merits than the boys.

Show this information on the bar chart.

[3 marks]

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7

Turn over ►



2 A wall has a pattern of 24 tiles.

$\frac{1}{2}$  of the tiles are blue.

$\frac{1}{3}$  of the tiles are green.

The rest of the tiles are white.

2 (a) How many tiles are white?  
You may use the grid to help you.

[3 marks]


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Answer .....



**2 (b)** Gary is tiling a wall with an area of 5.5 square metres.  
He needs 8 tiles per square metre.  
The tiles cost £2.25 each.

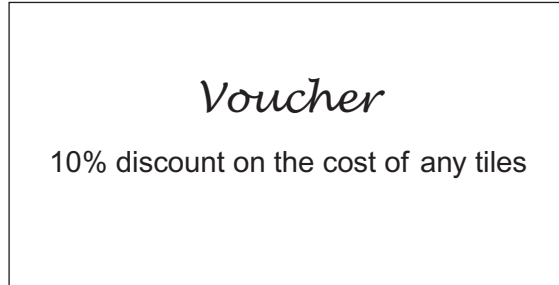
Is £100 enough for the tiles he needs?  
You **must** show your working.

**[3 marks]**

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**\*2 (c)** Jack is buying some tiles.  
The cost of the tiles is £198

He is given this voucher.



He uses the voucher when he buys the tiles.

Work out the discount he gets.

**[2 marks]**

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£ .....

8

Turn over ►



3 40 people were asked how many televisions they have in their home. The pictogram shows the results for 0 to 3 televisions.



represents four people

<b>Number of televisions in the home</b>	<b>0</b>	□
	<b>1</b>	
	<b>2</b>	
	<b>3</b>	
	<b>4 or more</b>	

3 (a) How many of these people have exactly 2 televisions?

[1 mark]

Answer .....

3 (b) How many of these people do not have a television?

[1 mark]

Answer .....

3 (c) Complete the pictogram.

[2 marks]

.....



4 Lynn buys

- one box of cereal costing £2.45
- one carton of juice costing £1.79
- and
- two boxes of eggs.

She pays with a £10 note.  
She gets £1.94 change.

Work out the cost of **one** box of eggs.

**[4 marks]**

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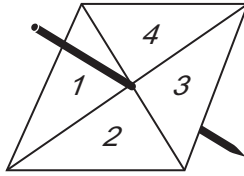
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£ .....

**Turn over for the next question**



5 A fair spinner has four equal sections numbered 1, 2, 3 and 4



The spinner is spun twice.  
The two numbers are added together to give the total score.

The table shows some of the possible total scores.

		First spin			
		1	2	3	4
Second spin	1	2	3	4	5
	2	3	4	5	
	3	4	5		
	4	5			

5 (a) Complete the table. [1 mark]

5 (b) Which total score is the mode? [1 mark]

Answer .....

5 (c) Write down **two** possible total scores that are equally likely. [1 mark]

Answer ..... and .....





6 Aled has these coins.



Aled buys a magazine costing £2.90

He uses four of the coins to pay for the magazine.

He receives two coins for his change.

List **all** the coins he now has.

[3 marks]

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Answer .....



**7** Mike buys lunch at work.  
The amount he spends each day for ten days is shown.

£4.20	£3.95	£6.30	£2.80	£3.50
£4.00	£3.75	£4.90	£5.10	£4.30

**7 (a)** Calculate the mean amount he spends each day.

**[3 marks]**

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£ .....

**7 (b)** Mike wants to reduce the amount he spends.

He says,

“I will spend a maximum of £4 each day for the next ten days.

This means I will spend less than I did in the first ten days.”

Is he correct?

Give a reason for your answer.

**[1 mark]**

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8 Jed is organising a trip.  
He needs to book coaches for 160 people.

A 48-seater coach costs £325

A 72-seater coach costs £460

Work out the **cheapest** way Jed can book enough coaches for 160 people.  
State the total cost.  
You **must** show your working.

[4 marks]

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Number of 48-seater coaches .....

Number of 72-seater coaches .....

Total cost £ .....

**Turn over for the next question**

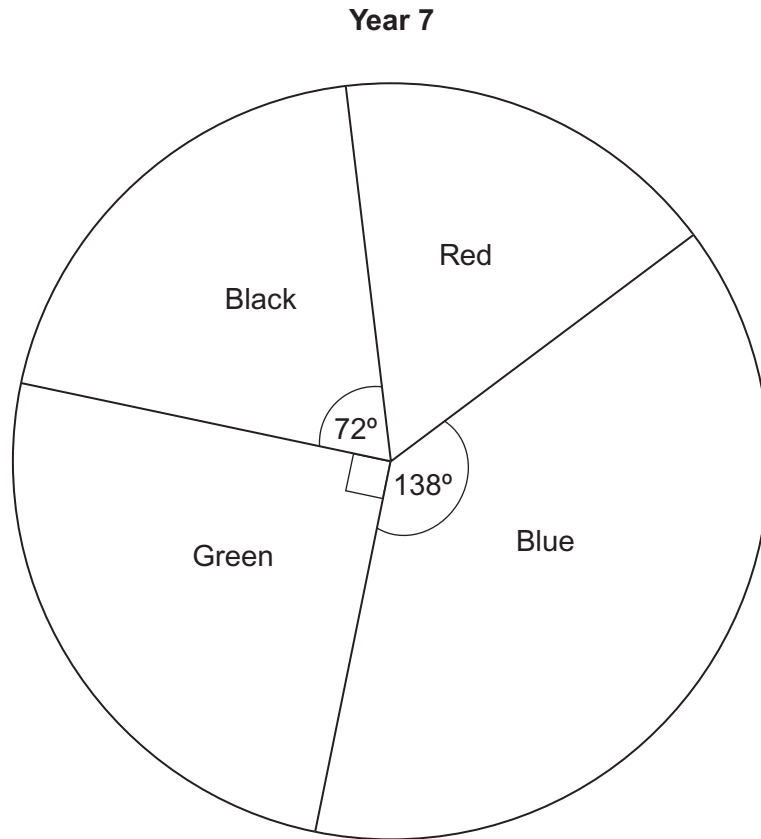
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**Turn over ►**



- 9 Students voted for a colour for their new uniform.  
They chose from four colours.

This pie chart shows the results from 240 Year 7 students.



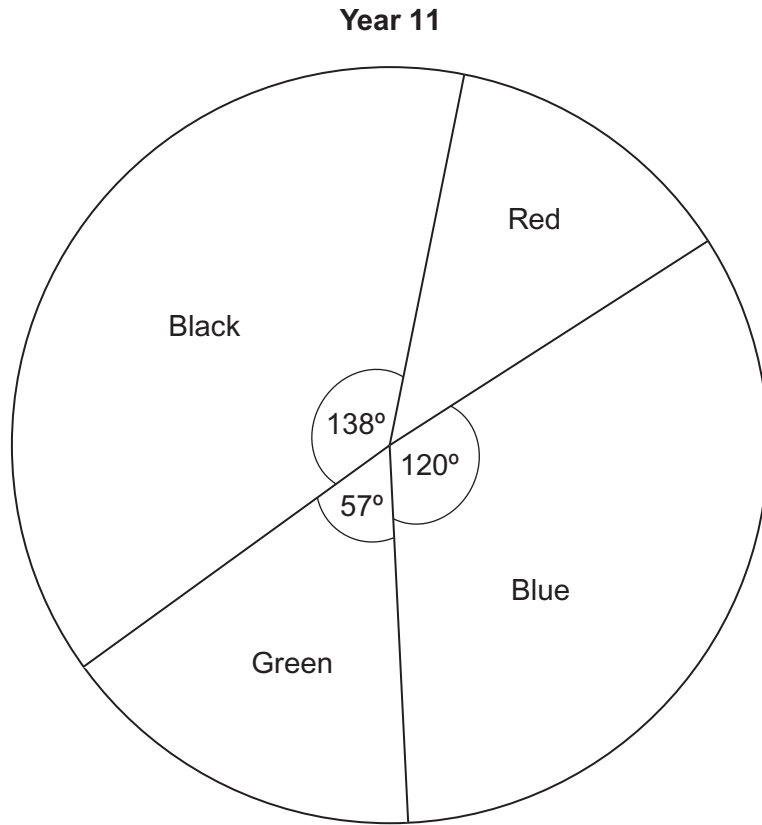
- 9 (a) What percentage of Year 7 students chose **green**?

[1 mark]

Answer ..... %



The pie chart below shows the results from 240 Year 11 students.



**9 (b)** What fraction of **Year 11** students chose **blue**?  
Give your answer in its simplest form.

[1 mark]

Answer .....

**9 (c)** How many **more** students in Year 7 chose **red** than in Year 11?

[5 marks]

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Answer .....

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Turn over ►

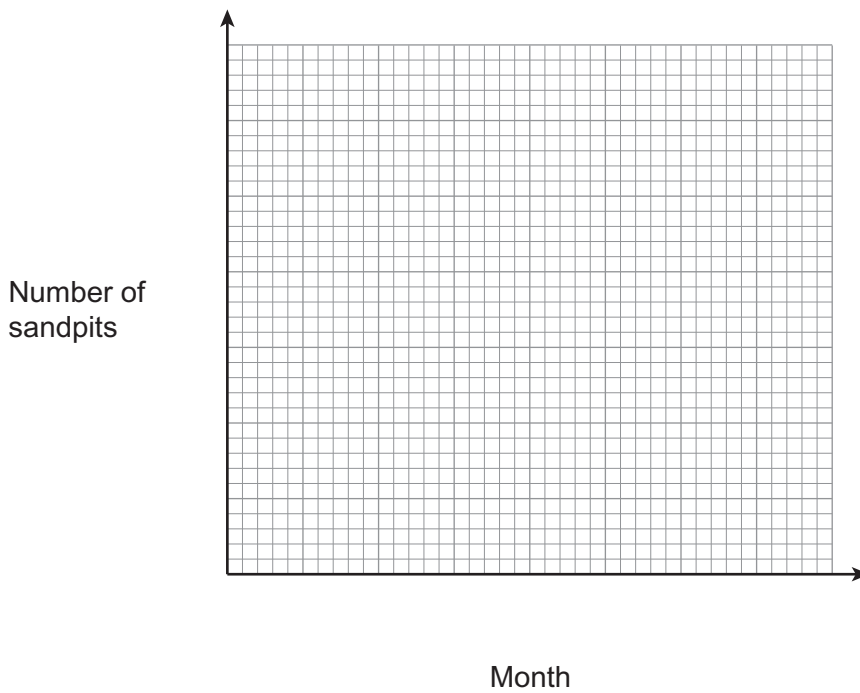


**10** A toy shop sells children’s sandpits.  
The table shows the number sold each month from April to October.

Month	April	May	June	July	Aug	Sept	Oct
Number of sandpits	12	20	23	29	15	10	5

**10 (a)** Draw a time series graph for the data.

**[3 marks]**



**10 (b)** Describe the sales pattern shown by your graph.

**[1 mark]**

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**11 (a)** Ben wants to save 20% of his wages.

Circle the multiplier he should use to work out 20%

$\times 0.02$

$\times 0.05$

$\times 0.2$

$\times 0.8$

$\times 1.2$

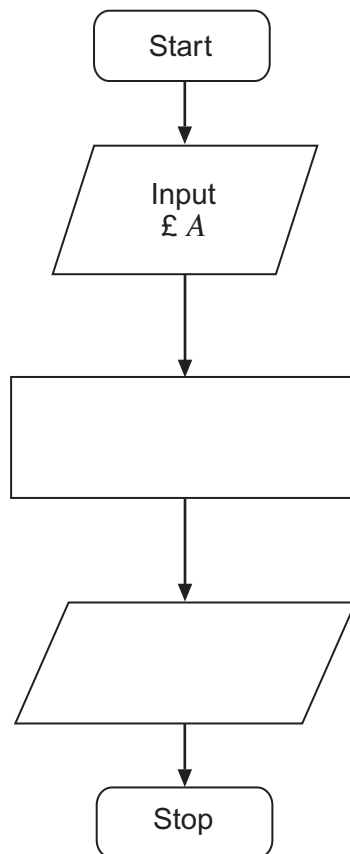
**[1 mark]**

**11 (b)** Ella buys a savings bond.

The bond pays 5% interest per year.

Complete this flow chart to work out the interest,  $\pounds I$ , each year on an investment of  $\pounds A$ .

**[3 marks]**



12 Emma counts the number of people travelling in 50 cars.  
The spreadsheet shows her results.

	A	B	C
1	Number of people ( $x$ )	Frequency ( $f$ )	$fx$
2	1	18	18
3	2	14	28
4	3	6	18
5	4	9	36
6	5	3	15
7		<b>Total =</b>	115

12 (a) Write down the formula used in cell C6

[1 mark]

Answer .....

12 (b) Write down the formula used in cell C7

[2 marks]

Answer .....

12 (c) Emma uses this formula = C7/50

Circle the statistical measure she is working out.

[1 mark]

Mean

Median

Mode

Range

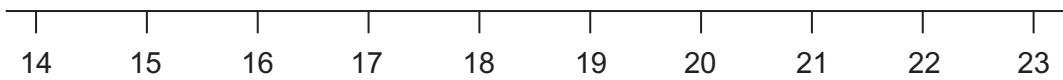




**13** One evening Anna, Dave and Tia were waiting for different buses.  
Anna waited for 22 minutes.

**\*13 (a)** Dave waited for more than 15 minutes but for less time than Anna.  
Show Dave's possible waiting times on the number line.

**[2 marks]**



**13 (b)** Tia waited for  $x$  minutes.  
She waited longer than Anna but no more than 25 minutes.

Show her possible waiting times as an inequality.

**[2 marks]**

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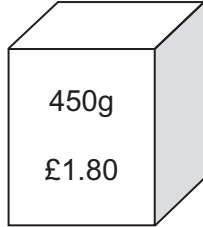
Answer .....

**Turn over for the next question**

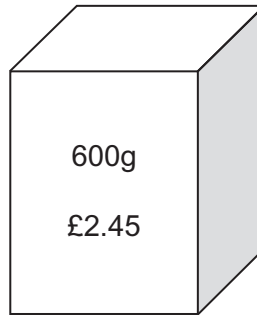


**\*14** A supermarket sells boxes of cereal in two sizes.

**Regular**



**Large**



Which box gives the better value for money?  
You **must** show your working.

**[3 marks]**

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Answer .....



**15** Jenny is comparing monthly costs when using different electricity companies.  
 'Sparks' electricity company  
 has a standing charge of £7.25  
 and  
 charges 21p for every unit of electricity used.

**15 (a)** Write a formula for the total charge, £  $C$ , when  $n$  units of electricity are used. **[2 marks]**

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Answer .....

**15 (b)** 'Brightness' electricity company  
 has a standing charge of £9.95  
 and  
 charges 19p for every unit of electricity used.

Jenny works out that both companies would have charged the same amount last month.

Set up and solve an equation to work out how many units of electricity she used last month.

**[4 marks]**

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Answer .....

9
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**Turn over ►**



- 16** A bag contains 500 counters.  
Each counter has a shape on it.

Ali and Jake do some trials to estimate how many counters in the bag have a square.

A trial consists of

- taking a counter at random
- recording the shape on the counter
- putting the counter back in the bag.

The results of their trials are shown in the table.

	Number of trials	Number of counters that have a square
Ali	30	9
Jake	100	37

- 16 (a)** Write down the relative frequency of Ali taking a counter that has a square.

**[1 mark]**

Answer .....

- 16 (b)** Work out the relative frequency of Jake taking a counter that does **not** have a square.

**[1 mark]**

Answer .....



**16 (c)** Whose trials would give a more reliable estimate of the number of counters that have a square?  
Give a reason for your answer. **[1 mark]**

Answer .....

Reason .....

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**16 (d)** There are 500 counters in the bag.  
Estimate the number of counters that have a square. **[1 mark]**

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Answer .....

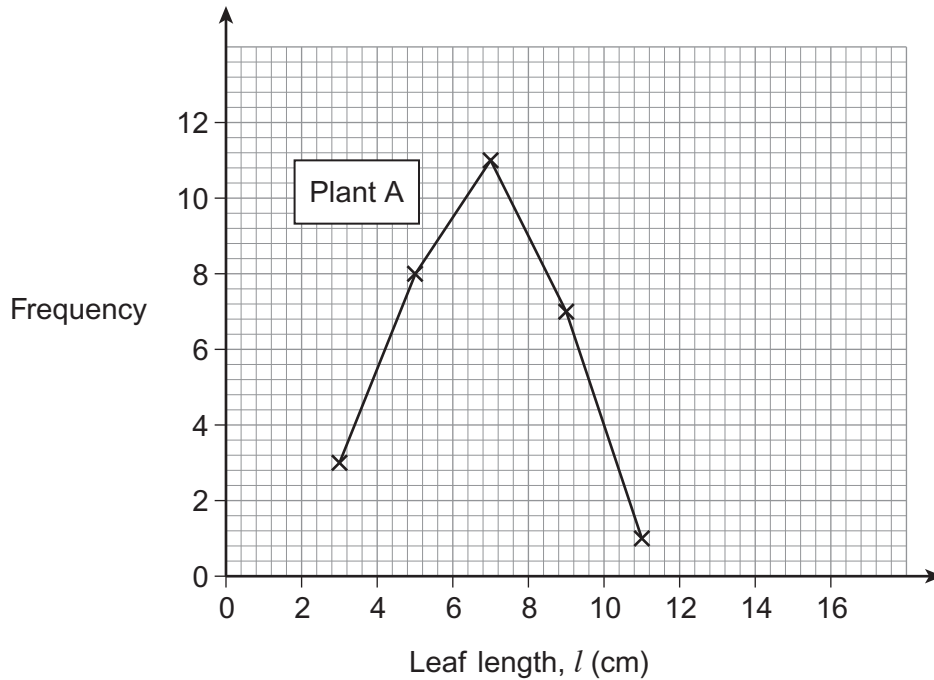
**Turn over for the next question**

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**Turn over ►**



17 Feli is given leaves from two plants in a science lesson. The frequency polygon shows the lengths, in cm, of 30 leaves from plant A.



The table shows the lengths of 30 leaves from plant B.

Leaf length, $l$ (cm)	$6 \leq l < 8$	$8 \leq l < 10$	$10 \leq l < 12$	$12 \leq l < 14$	$14 \leq l < 16$
Frequency	4	8	10	5	3

17 (a) Draw a frequency polygon for the leaves from plant B on the same grid as for plant A. **[2 marks]**

17 (b) Feli finds a leaf on the classroom floor. The leaf has a length of 11 cm. Is the leaf more likely to be from plant A or plant B? Give a reason for your answer.

**[1 mark]**

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**18** Vikki orders 500 kg of soil.  
It is delivered in 16 small sacks and 8 large sacks.

A large sack holds three times as much soil as a small sack.

Work out the amount of soil each sack holds.

**[4 marks]**

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Small sack ..... kg

Large sack ..... kg

**END OF QUESTIONS**

7
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**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**

