OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE

J567/02

MATHEMATICS B

Paper 2 (Foundation Tier)

FRIDAY 13 JUNE 2014: Morning
DURATION: 1 hour 30 minutes
plus your additional time allowance

MODIFIED ENLARGED

Candidate forename		Candidate surname	

Centre number						Candidate number				

Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

Geometrical instruments
Tracing paper (optional)
Scientific or graphical calculator

YOU ARE PERMITTED TO USE A CALCULATOR FOR THIS PAPER

READ INSTRUCTIONS OVERLEAF

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INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.

Use black ink. HB pencil may be used for graphs and diagrams only.

Answer ALL the questions.

Read each question carefully. Make sure you know what you have to do before starting your answer.

Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.

Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).

INFORMATION FOR CANDIDATES

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

Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.

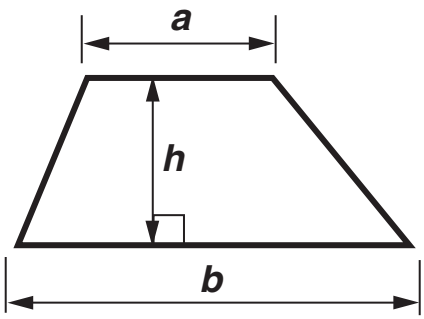
The quality of written communication is assessed in questions marked with an asterisk (*).

The total number of marks for this paper is 100.

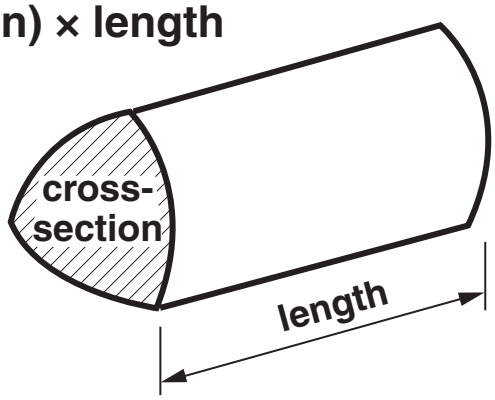
Any blank pages are indicated.

FORMULAE SHEET: FOUNDATION TIER

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



Volume of prism = (area of cross-section) × length



Answer ALL the questions.

1 Lynne drove to work each morning for a week. She recorded the temperatures, in degrees Celsius, inside her car in this table.

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
-2	-5	3	4	-1

(a) Which day was the coldest?

(a) _____ [1]

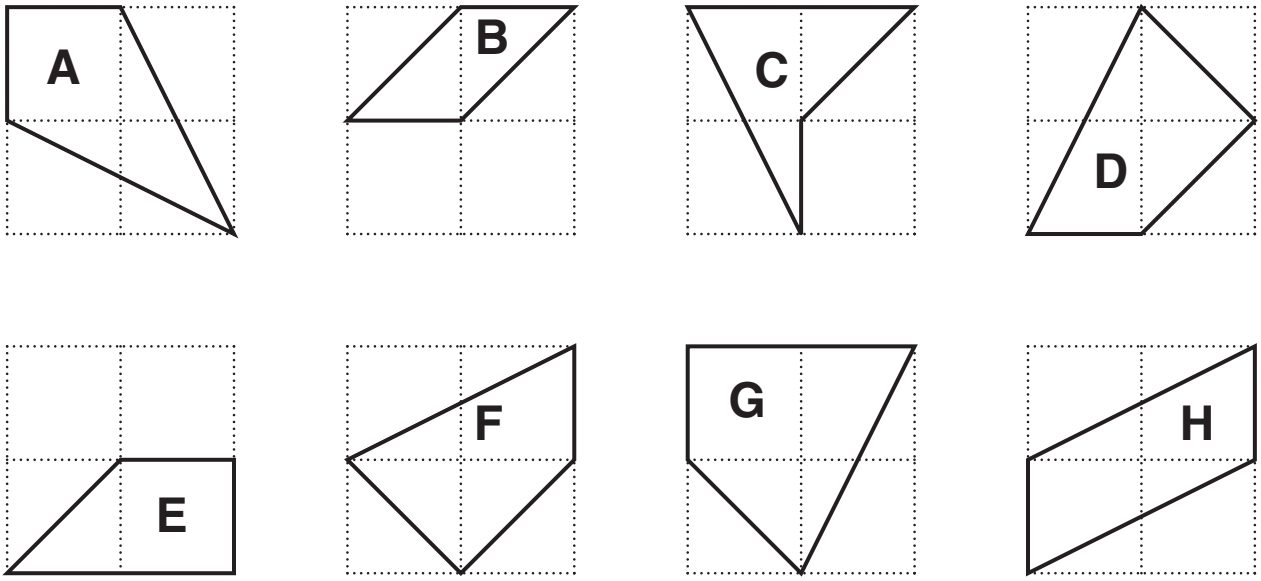
(b) Write the temperatures in order, starting with the coldest.

(b) _____ _____ _____ _____ _____ [1]
coldest

(c) By how many degrees did the temperature change from Tuesday morning to Wednesday morning?

(c) _____ °C [1]

2 Jason draws some quadrilaterals on square grids. The 8 quadrilaterals are shown below.



(a) Which quadrilateral contains a reflex angle?

(a) _____ [1]

(b) Which quadrilateral has one line of symmetry?

(b) _____ [1]

(c) Which TWO quadrilaterals are parallelograms?

(c) _____ and _____ [1]

(d) Which quadrilateral contains a right angle AND is a trapezium?

(d) _____ [1]

(e) Which TWO quadrilaterals are congruent?

(e) _____ and _____ [1]

3 This is the train timetable from Ellerbridge to Longstone on a weekday.

Ellerbridge	0705	0925	1305	1725	1905
Fieldham	0718	–	1318	–	1918
Tinborough	0750	1015	1350	1815	1950
Middleford	0822	1051	1422	1851	2022
Longstone	0850	1122	1450	1922	2050

(a) How many trains go from Fieldham to Longstone on a weekday?

(a) _____ [1]

(b) Alina goes from Fieldham to Middleford on the train.
She catches the train at 1318.

(i) At what time should her train arrive at Middleford?

(b)(i) _____ [1]

(ii) How many minutes should her train journey take?

(ii) _____ minutes [1]

(c) How long should the 17 25 train from Ellerbridge take to reach Longstone?

(c) _____hour _____ minutes [1]

(d) Glyn lives in Ellerbridge.
He needs to be in Tinborough by twenty past two in the afternoon.

What is the latest train that Glyn can catch to get to Tinborough on time?

(d) _____ [1]

4 Here is a list of numbers.

20 21 22 23 24 25 26 27 28

(a) From this list, write down a number that is

(i) a multiple of 8,

(a)(i) _____ [1]

(ii) a square,

(ii) _____ [1]

(iii) a cube,

(iii) _____ [1]

(iv) prime.

(iv) _____ [1]

(b) Which two numbers in the list have a common factor of 7?

(b) _____ and _____ [1]

5 (a) A school asked the parents of their students the following question:

> Do you think that school uniform is a good idea?

The parents replied 'Good idea', 'Bad idea' or 'Don't know'.
The results of those who replied are shown in this table.

Good idea	65%
Bad idea	28%
Don't know	

(i) Complete the table above by filling in the missing number. [1]

(ii) Altogether 420 parents replied.

How many replied 'Good idea'?

(a)(ii) _____ [2]

(b) A different school asked the same question. Their results are shown in this table.

Good idea	70%
Bad idea	20%
Don't know	10%

96 parents replied 'Bad idea'.

How many parents replied 'Good idea'?

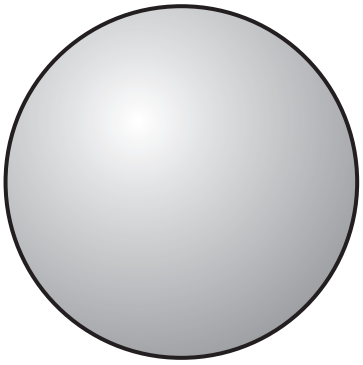
(b) _____ [2]

6 (a) Here is a list of the names of some shapes.

sphere	cube	cylinder	cone	circle

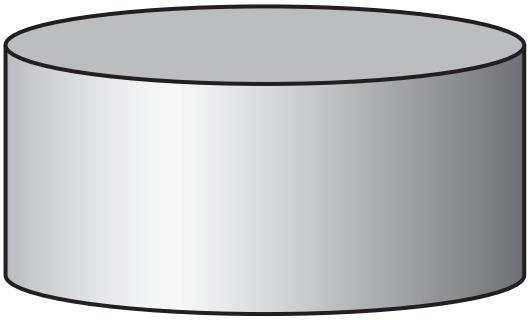
Choose a name from the list to describe each of these SOLIDS.

(i)



(a)(i) _____ **[1]**

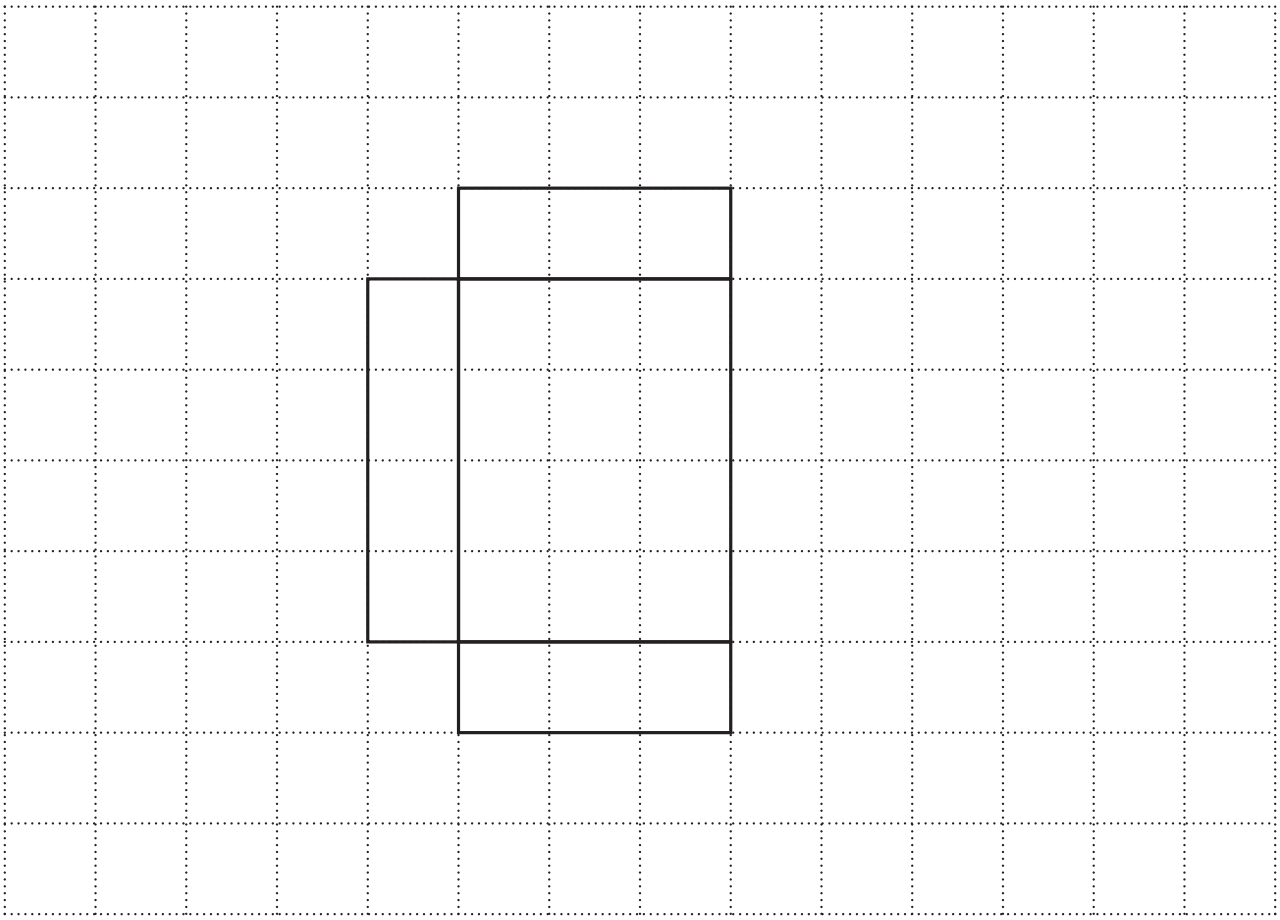
(ii)



(ii) _____ **[1]**

(b) This is part of a net of a cuboid drawn on squared paper.

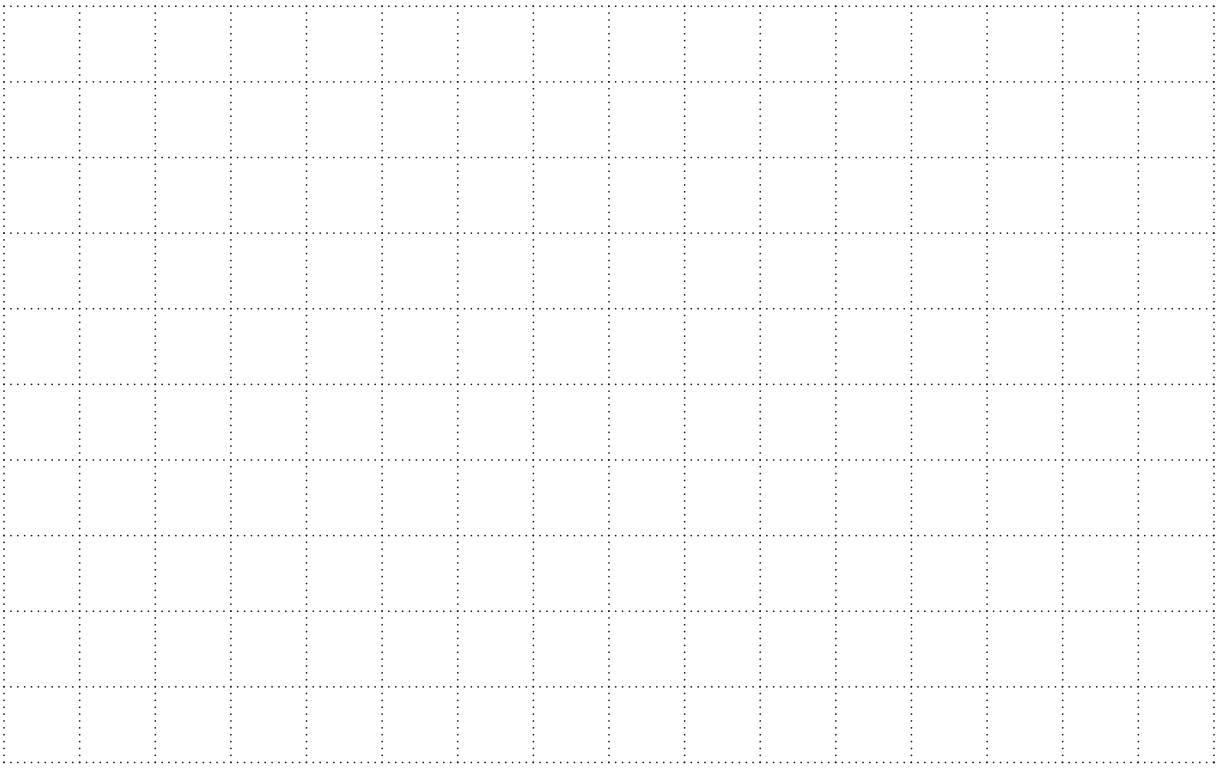
Complete the net of the cuboid on the grid below.



[2]

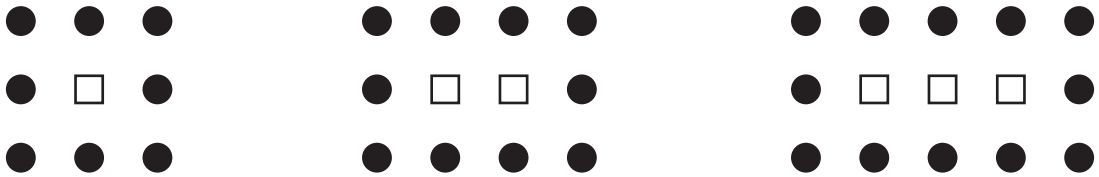
7* Clare draws some rectangles.
Each rectangle has an area of 18 cm^2.
The sides, when measured in centimetres, are whole numbers.

What are all the possible perimeters of her rectangles?



_____ **[5]**

8 Eloise draws a sequence of patterns. The first three patterns are shown below.



(a) Draw the next pattern in the sequence. [1]

(b) Complete this table.

squares	1	2	3	4	5
circles	8	10	12		

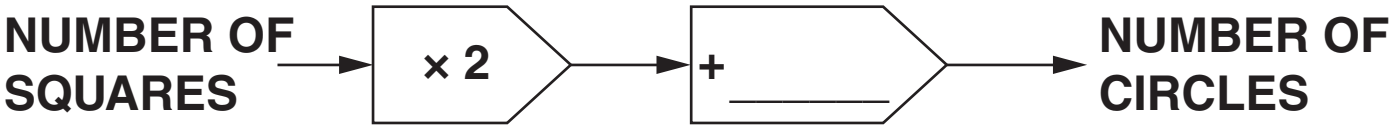
[1]

(c) The sequence is continued.

How many circles will there be when there are 10 squares?

(c) _____ [1]

(d) (i) **Complete the following rule for the patterns by filling in the missing number.**

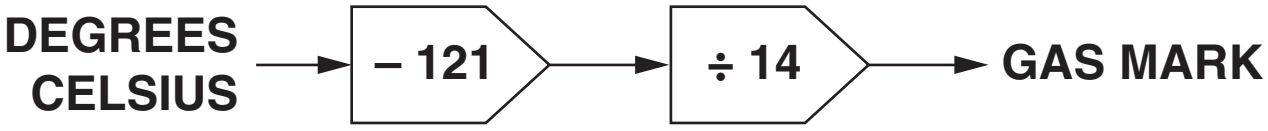


[1]

(ii) **Use this rule to work out how many circles there will be when there are 150 squares.**

(d)(ii) _____ **[1]**

9 Tony uses this rule to convert temperatures in degrees Celsius to a gas mark for his oven.



(a) A recipe for roasting meat gives the temperature as 205°C.

Use the rule to work out the gas mark needed in this recipe.

(a) _____ [2]

(b) Use the rule to work out the temperature, in degrees Celsius, equivalent to gas mark 4.

(b) _____ °C [2]

(c) Using the rule above, which of the following formulas converts degrees Celsius, *C*, to a gas mark, *G*?
Circle the correct answer.

$G = 121 - 14C$

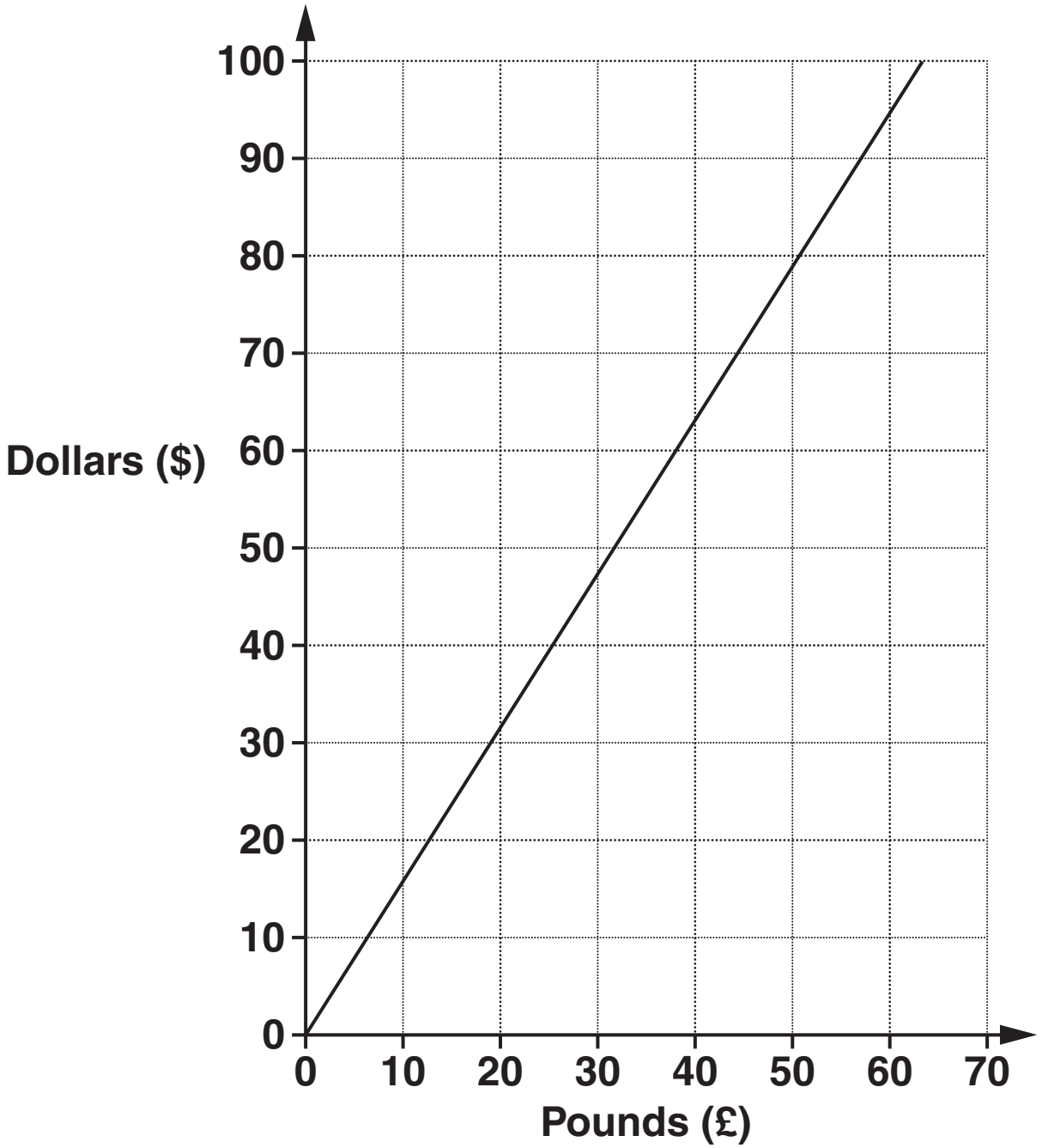
$G = \frac{C}{14} - 121$

$G = 14C - 121$

$G = \frac{C - 121}{14}$

[1]

10 This is a conversion graph between pounds and American dollars.



(a) (i) Hilary changed £30 into dollars.

Use the graph to find how many dollars she received.

(a)(i) $ _____ [1]

(ii) Umar changed $66 into pounds.

Use the graph to find how many pounds he received.

(ii) £ _____ [1]

(b) Adele used the graph to work out how many dollars she would receive when changing £110 into dollars.

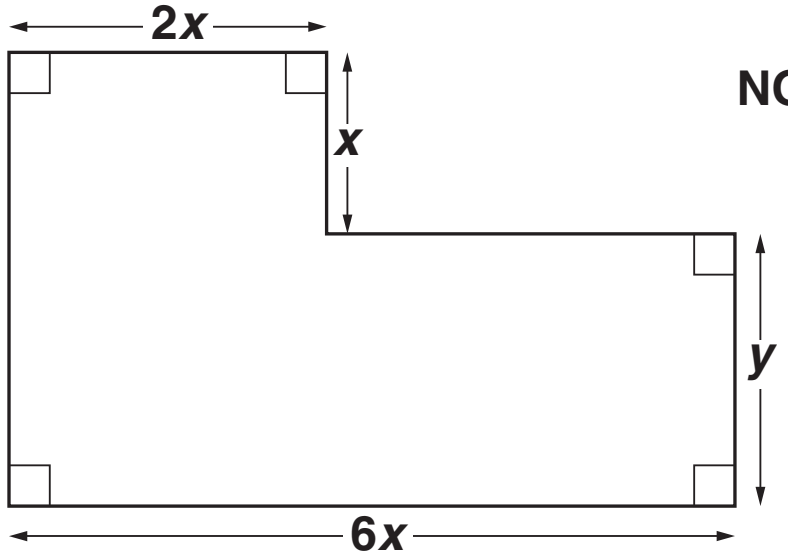
Use the graph to change £110 into dollars. Explain how you obtained your answer.

_____

_____

_____ **[2]**

11 Write down an expression for the perimeter of the shape below.
Give your answer in its simplest form.

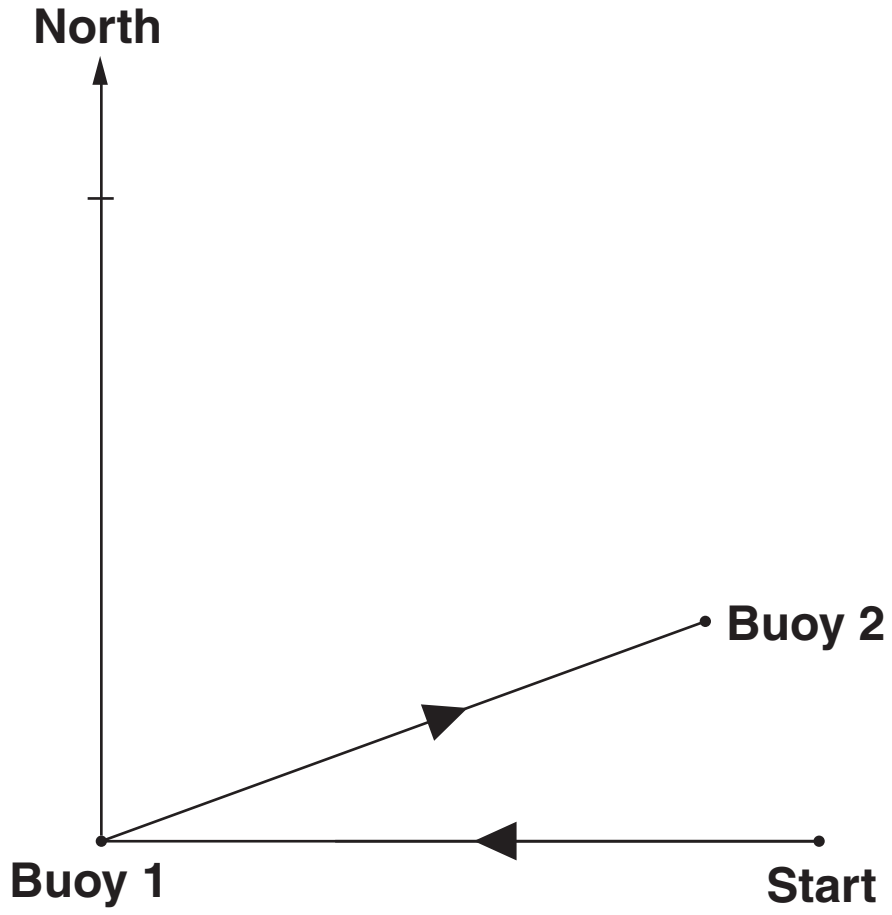


NOT TO SCALE

_____ **[3]**

12 A motor boat race has three legs.
The first two legs are shown on this map.

SCALE: 1 cm REPRESENTS 5 km



(a) The first leg is from the Start to Buoy 1.

(i) In which compass direction are the boats heading on the first leg?

(a)(i) _____ [1]

(ii) Work out the distance, in kilometres, of the first leg.

(ii) _____ km [2]

(b) The second leg is from Buoy 1 to Buoy 2.

On what bearing are the boats heading on the second leg?

(b) _____ ° [1]

(c) The third leg is from Buoy 2 to the Finish.
It is a distance of 30 km on a bearing of 050°.

Draw a straight line on the map on the opposite page to show the third leg of the race. [2]

13 There is an outbreak of chickenpox in a city.
Of the children who have chickenpox:

one eighth are under 6 years old

three eighths are from 6 to 9 years old

96 are over 9 years old.

How many children in the city altogether have got chickenpox?

_____ **[3]**

14 Five whole numbers have the following properties:

the range is 9

the largest number is 11

the mode is 8

the mean is 7.

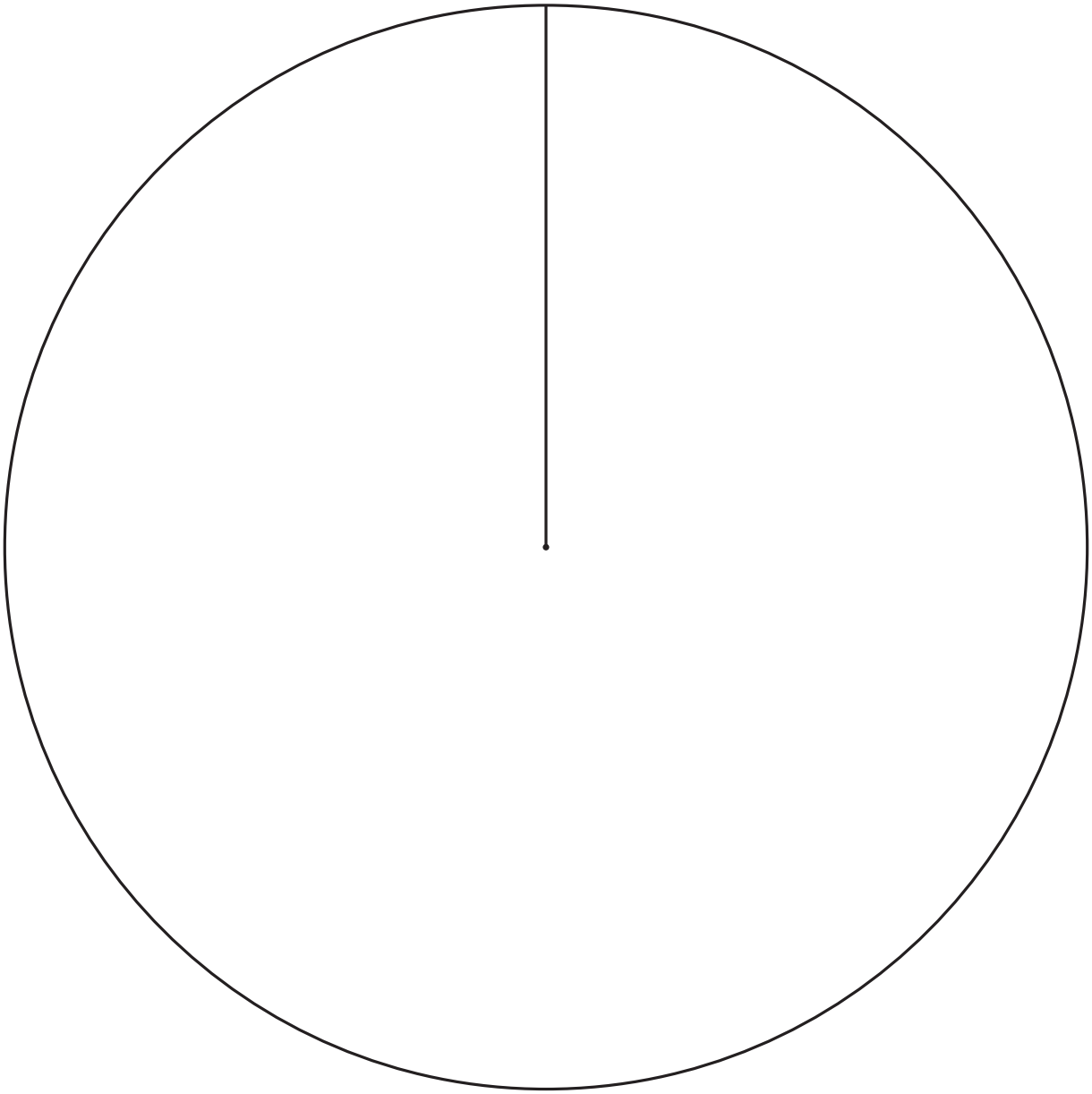
What are the five numbers?

_____ _____ _____ _____ _____ **[3]**

15 **In 2013, Eastport Council had a budget of 90 million pounds.**
The table shows how the council spent its budget, in millions of pounds.

Education	**45**
Social Services	**21**
Environmental Services	**15**
Other Services	**9**

Draw and label a pie chart to represent this data in the circle below.



[4]

16 Gill has five boxes that contain only red and yellow counters. Information about the boxes is shown in the following table.

box A	8 red, 4 yellow
box B	9 red, 6 yellow
box C	5 red, 2 yellow
box D	5 red, 7 yellow
box E	14 red, 6 yellow

She takes a counter from a box without looking.

(a) If she takes a counter from box A, what is the probability that it is red?

(a) _____ [1]

(b) If the probability that she takes a red counter is $\frac{5}{7}$, which box did she take it from?

(b) box _____ [1]

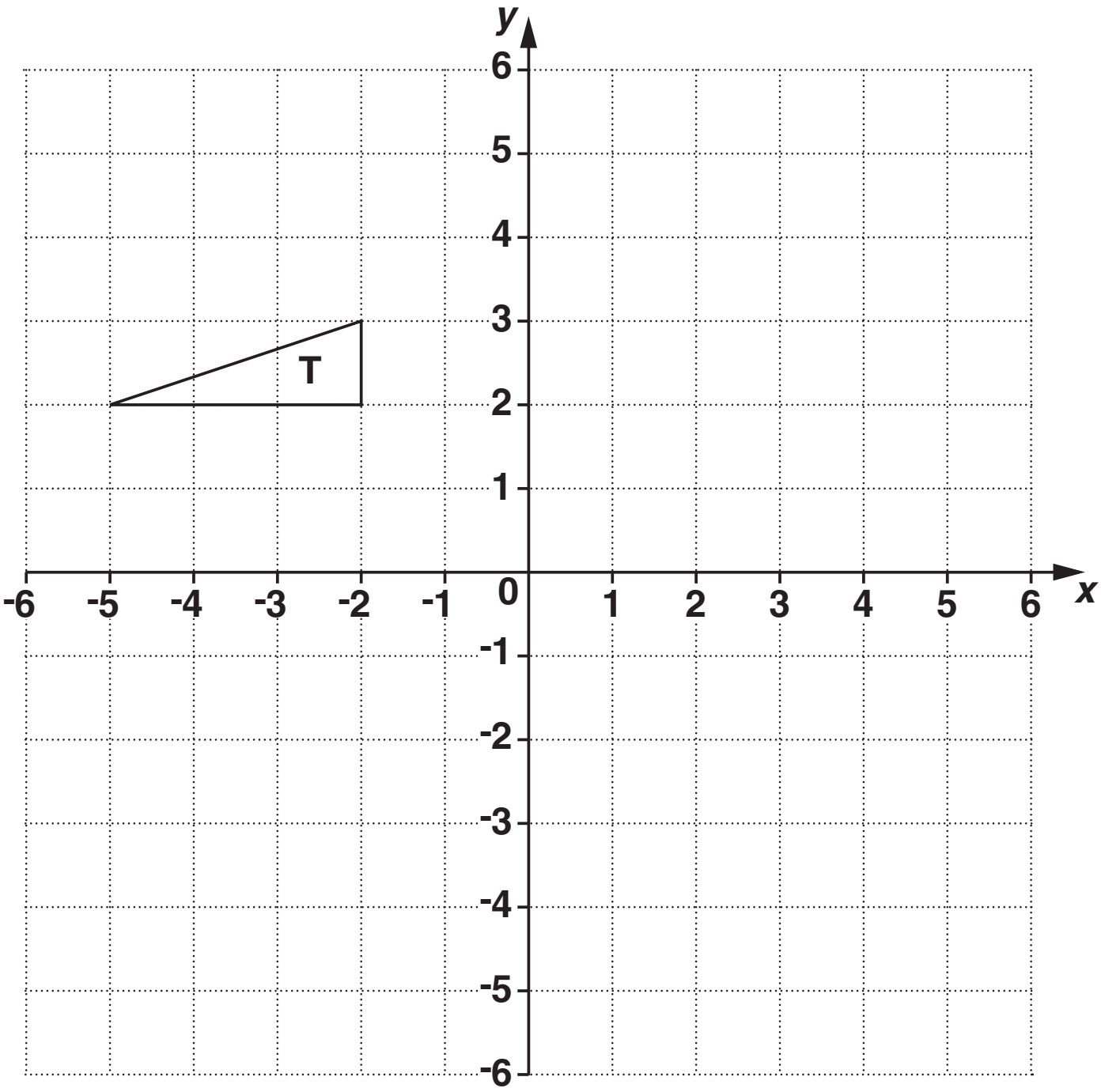
(c) If the probability that she takes a red counter is 0.7, which box did she take it from?

(c) box _____ [1]

(d) If the probability that she takes a red counter is 60%, which box did she take it from?

(d) box _____ [1]

17 Triangle T is drawn on the grid below.



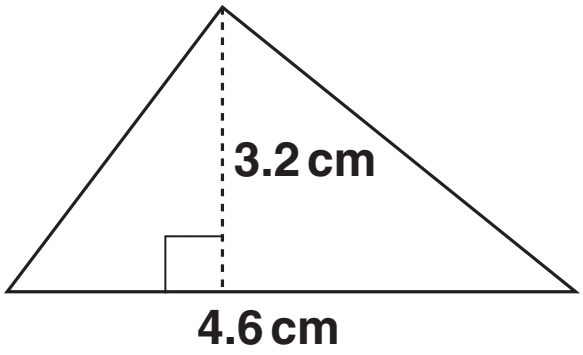
(a) Translate triangle T by $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$.

Label the image A. **[1]**

(b) Reflect triangle T in the line $y = 4$.

Label the image B. **[2]**

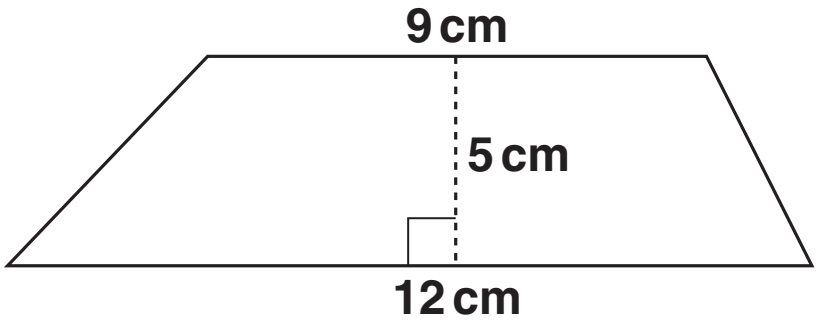
18 (a) Work out the area of this triangle.



NOT TO SCALE

(a) _____ cm^2 [2]

(b) Work out the area of this trapezium.



NOT TO SCALE

(b) _____ cm^2 [2]

19 (a) Work out.

$$\sqrt{4.7 \times 2.5 - 1.8^2}$$

Give your answer correct to three significant figures.

(a) _____ **[2]**

(b) (i) For part of her homework Tara wrote

The time taken for a journey is 2.25 hours.

This time in hours and minutes is 2 hours and 25 minutes.

Tara's answer is wrong.
Explain what is wrong with Tara's answer.

_____

_____ **[1]**

(ii) In another part of her homework Tara wrote

3570 ÷ 0.93 = 3391.5

Tara's answer is wrong.
Without working out the exact answer, explain how you can tell her answer is wrong.

_____

_____ **[1]**

20 Jayden makes a 5-sided spinner, numbered from 1 to 5.
He records the number of times he scores a 3 from different numbers of spins. His results are shown in the following table.

Number of spins	10	50	200
Number of times 3 scored	4	18	76
Relative frequency			

(a) Complete the table above to show the relative frequencies of scoring 3. There are three missing numbers to fill in. **[2]**

(b) Which of the relative frequencies gives the best estimate of the probability of scoring 3?
Give a reason for your answer.

_____ because _____

_____ **[1]**

(c) Estimate the number of times Jayden would expect to score a 3 if he spins the spinner 500 times.

(c) _____ **[1]**

(d) Is Jayden's spinner fair?
Give a reason for your answer.

_____ because _____

_____ [1]

21 Northland School records the number of times students are late for morning and afternoon sessions of school.

(a) The following table summarises this information for the 30 students of class 11R in one week.

NUMBER OF TIMES LATE	FREQUENCY	
0	11	
1	8	
2	6	
3	0	
4	3	
5	2	

Work out the mean number of times late.

(a) _____ [3]

(b) Each term, a letter is sent home if students are late for more than 15% of sessions.
Here is Karl's record for when he was in Year 10.

Autumn term	**140 sessions**	**24 late**
Spring term	**116 sessions**	**19 late**
Summer term	**128 sessions**	**15 late**

During which terms did Karl have a letter sent home about lateness?
Show all your working.

(b) _____ **[3]**

22 (a) The *n*th term of a sequence is given by $8n - 5$.

(i) Write down the first three terms of this sequence.

(a)(i) _____ _____ _____ [2]

**(ii) Is 96 a term in this sequence?
Give a reason for your answer.**

_____ because _____ [1]

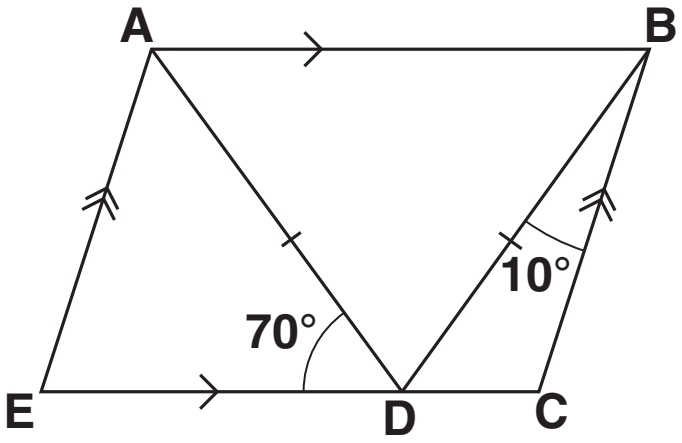
(b) Here are the first four terms of a different sequence.

16 9 2 -5

Write an expression for the *n*th term of this sequence.

(b) _____ [2]

23 The diagram below shows parallelogram ABCE.
D is a point on EC.
AD = BD, angle ADE = 70° and angle CBD = 10°.



NOT TO SCALE

Work out angle BCD.
Give a reason for each angle you work out.

Angle BCD = _____° [4]

END OF QUESTION PAPER

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