

**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 24pt**

|                               |  |                              |  |
|-------------------------------|--|------------------------------|--|
| <b>Candidate<br/>forename</b> |  | <b>Candidate<br/>surname</b> |  |
|-------------------------------|--|------------------------------|--|

|                          |  |  |  |  |  |                             |  |  |  |  |
|--------------------------|--|--|--|--|--|-----------------------------|--|--|--|--|
| <b>Centre<br/>number</b> |  |  |  |  |  | <b>Candidate<br/>number</b> |  |  |  |  |
|--------------------------|--|--|--|--|--|-----------------------------|--|--|--|--|

**Candidates answer on the Question Paper.**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Geometrical instruments**

**Tracing paper (optional)**

**Scientific or graphical calculator**

|   |
|---|
| <b>YOU ARE PERMITTED TO USE A<br/>CALCULATOR FOR THIS PAPER</b> |
|---|

**READ INSTRUCTIONS OVERLEAF**

## **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  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.**

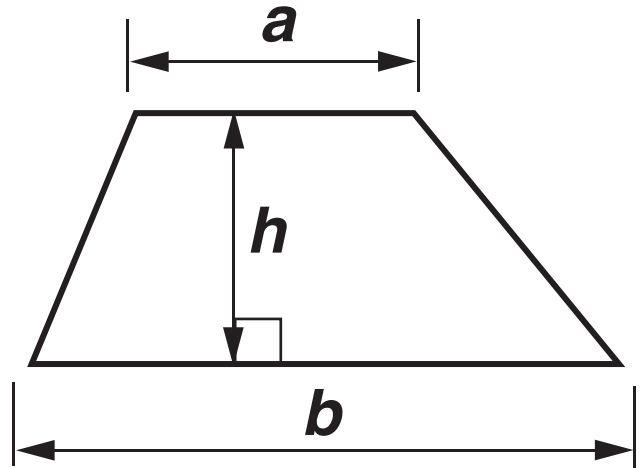
**The quality of written communication is assessed in questions marked with an asterisk (\*).**

**The total number of marks for this paper is 100.**

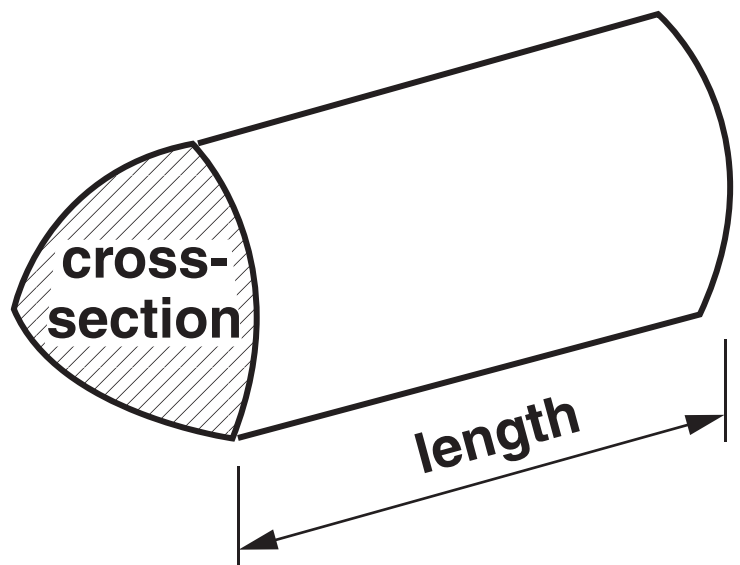
**Any blank pages are indicated.**

# FORMULAE SHEET: FOUNDATION TIER

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



$$\text{Volume of prism} = (\text{area of cross-section}) \times \text{length}$$



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**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 the table shown (opposite).**

**(a) Which day was the coldest?**

**(a) \_\_\_\_\_ [1]**

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

**(b) \_\_\_\_\_  
coldest**

**\_\_\_\_\_ [1]**

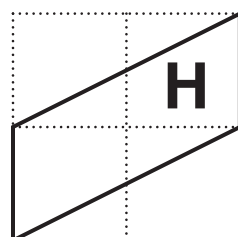
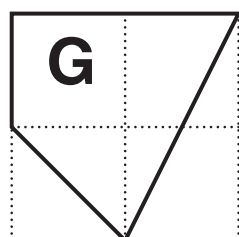
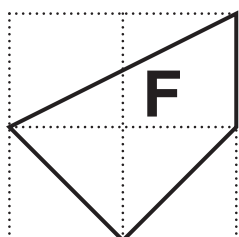
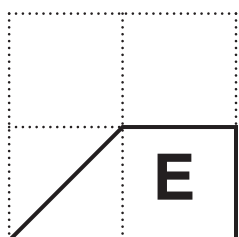
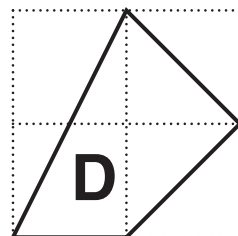
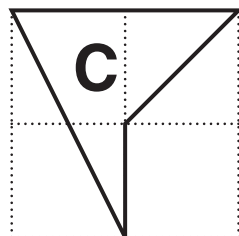
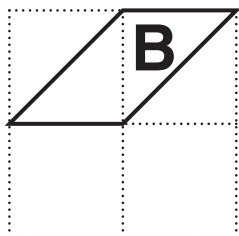
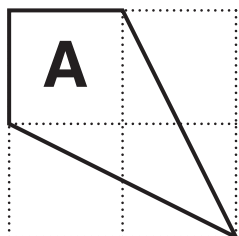
| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|--------|---------|-----------|----------|--------|
| -2     | -5      | 3         | 4        | -1     |

**(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.**

|                    |              |              |              |              |              |
|--------------------|--------------|--------------|--------------|--------------|--------------|
| <b>Ellerbridge</b> | <b>07 05</b> | <b>09 25</b> | <b>13 05</b> | <b>17 25</b> | <b>19 05</b> |
| <b>Fieldham</b>    | <b>07 18</b> | <b>–</b>     | <b>13 18</b> | <b>–</b>     | <b>19 18</b> |
| <b>Tinborough</b>  | <b>07 50</b> | <b>10 15</b> | <b>13 50</b> | <b>18 15</b> | <b>19 50</b> |
| <b>Middleford</b>  | <b>08 22</b> | <b>10 51</b> | <b>14 22</b> | <b>18 51</b> | <b>20 22</b> |
| <b>Longstone</b>   | <b>08 50</b> | <b>11 22</b> | <b>14 50</b> | <b>19 22</b> | <b>20 50</b> |

**(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 13 18.**

**(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.**

|                   |            |
|-------------------|------------|
| <b>Good idea</b>  | <b>65%</b> |
| <b>Bad idea</b>   | <b>28%</b> |
| <b>Don’t know</b> |            |



**(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.**

|                   |            |
|-------------------|------------|
| <b>Good idea</b>  | <b>70%</b> |
| <b>Bad idea</b>   | <b>20%</b> |
| <b>Don't know</b> | <b>10%</b> |

**96 parents replied 'Bad idea'.**

**How many parents replied 'Good idea'?**

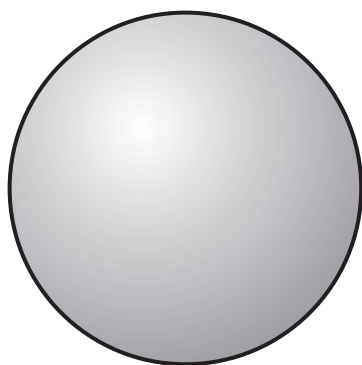
**(b) \_\_\_\_\_ [2]**

- 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]**

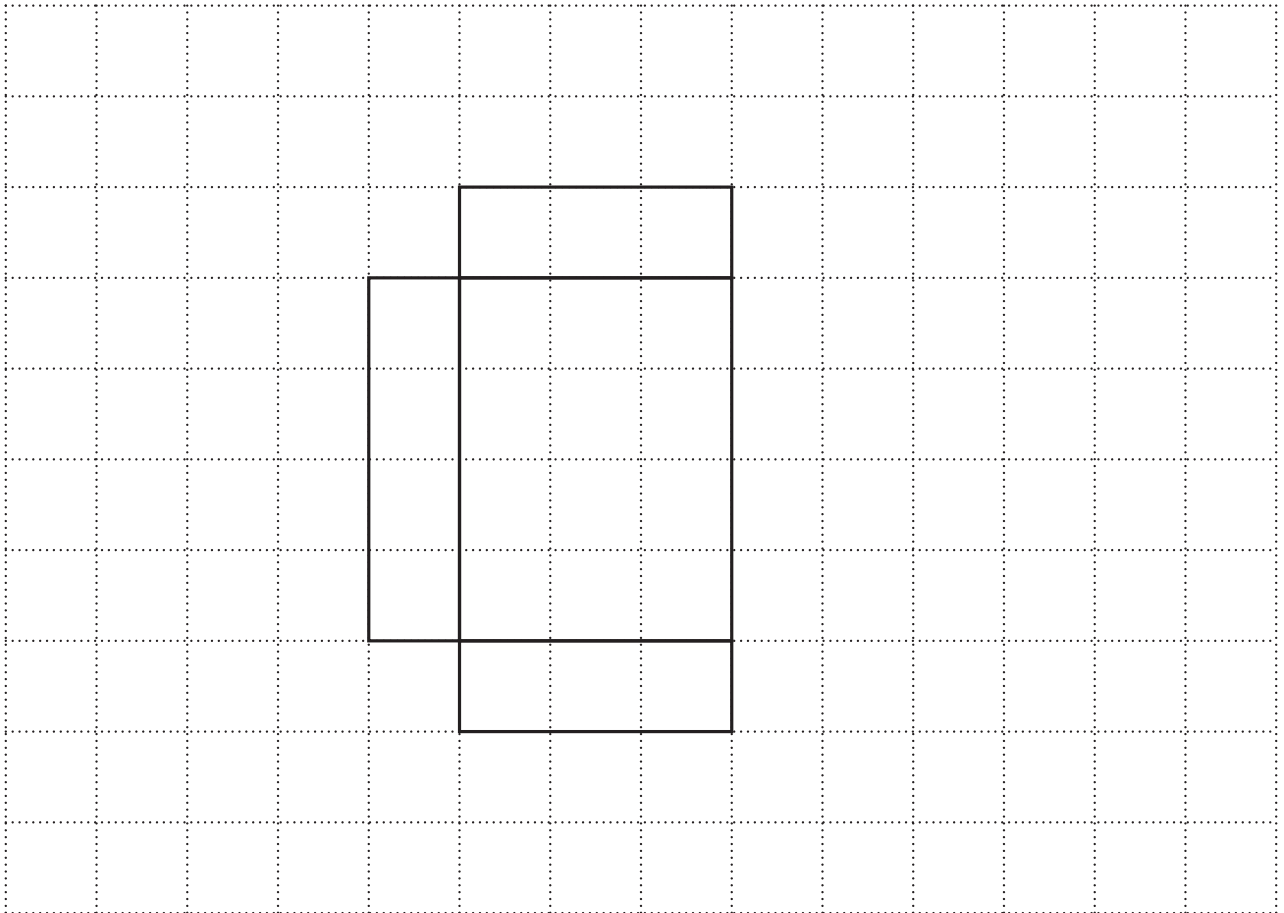
**(ii)**



**(ii)** \_\_\_\_\_ **[1]**

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

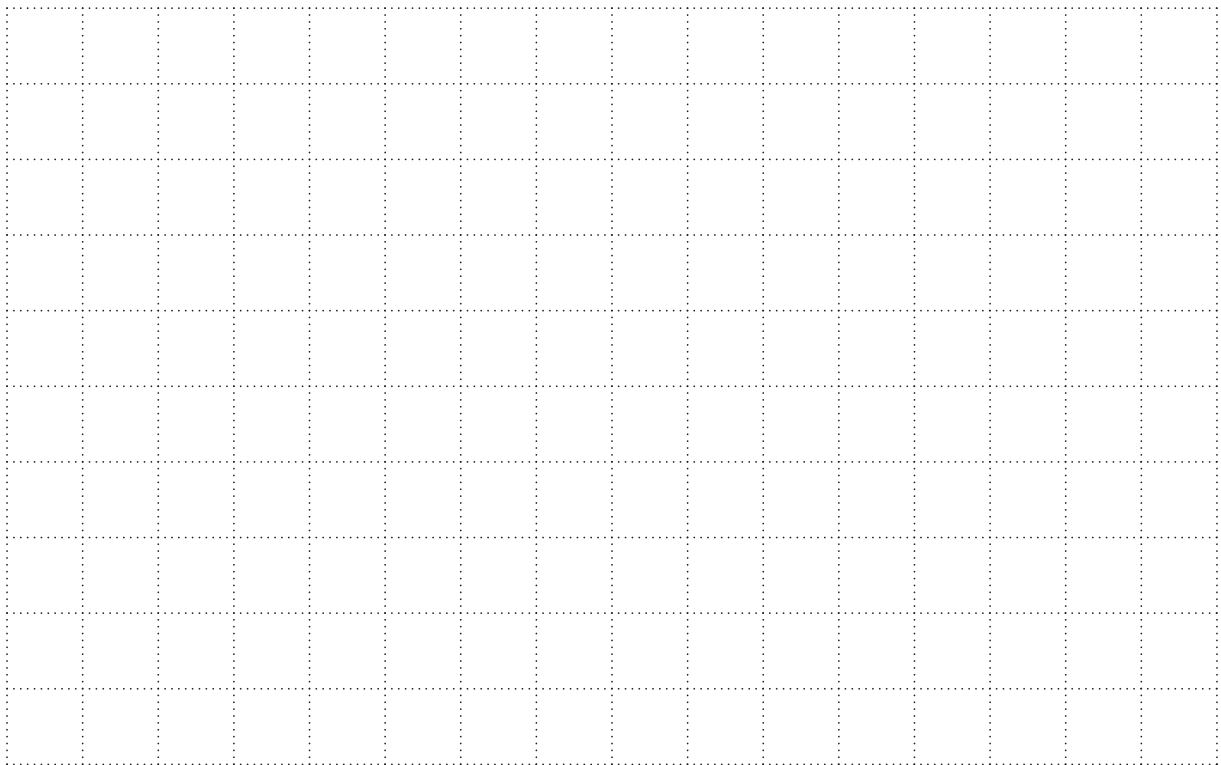
**Complete the net of the cuboid on the grid below.**



**[2]**

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

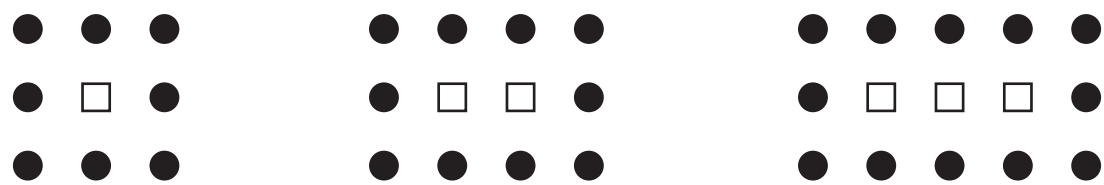
**What are all the possible perimeters of  
her rectangles?**



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**[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 |   |   |

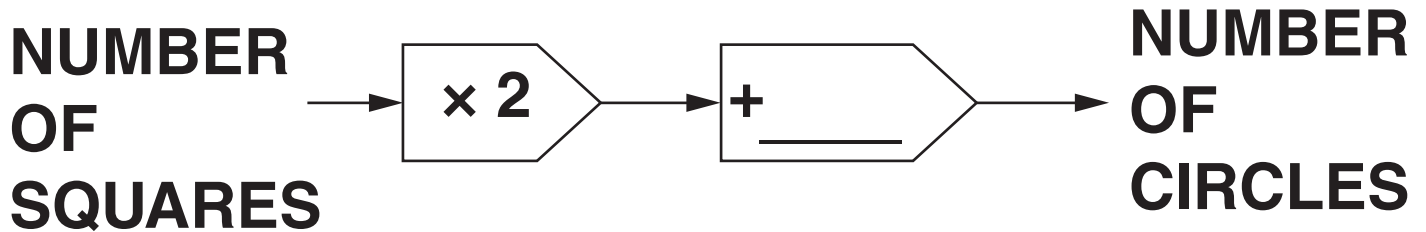
[1]

**(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.



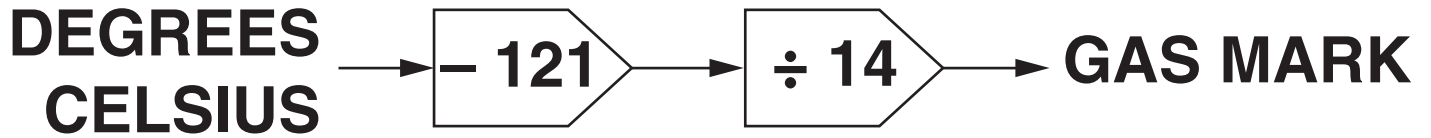
[1]

- (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  $205^{\circ}\text{C}$ .

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.

$$G = 121 - 14C$$

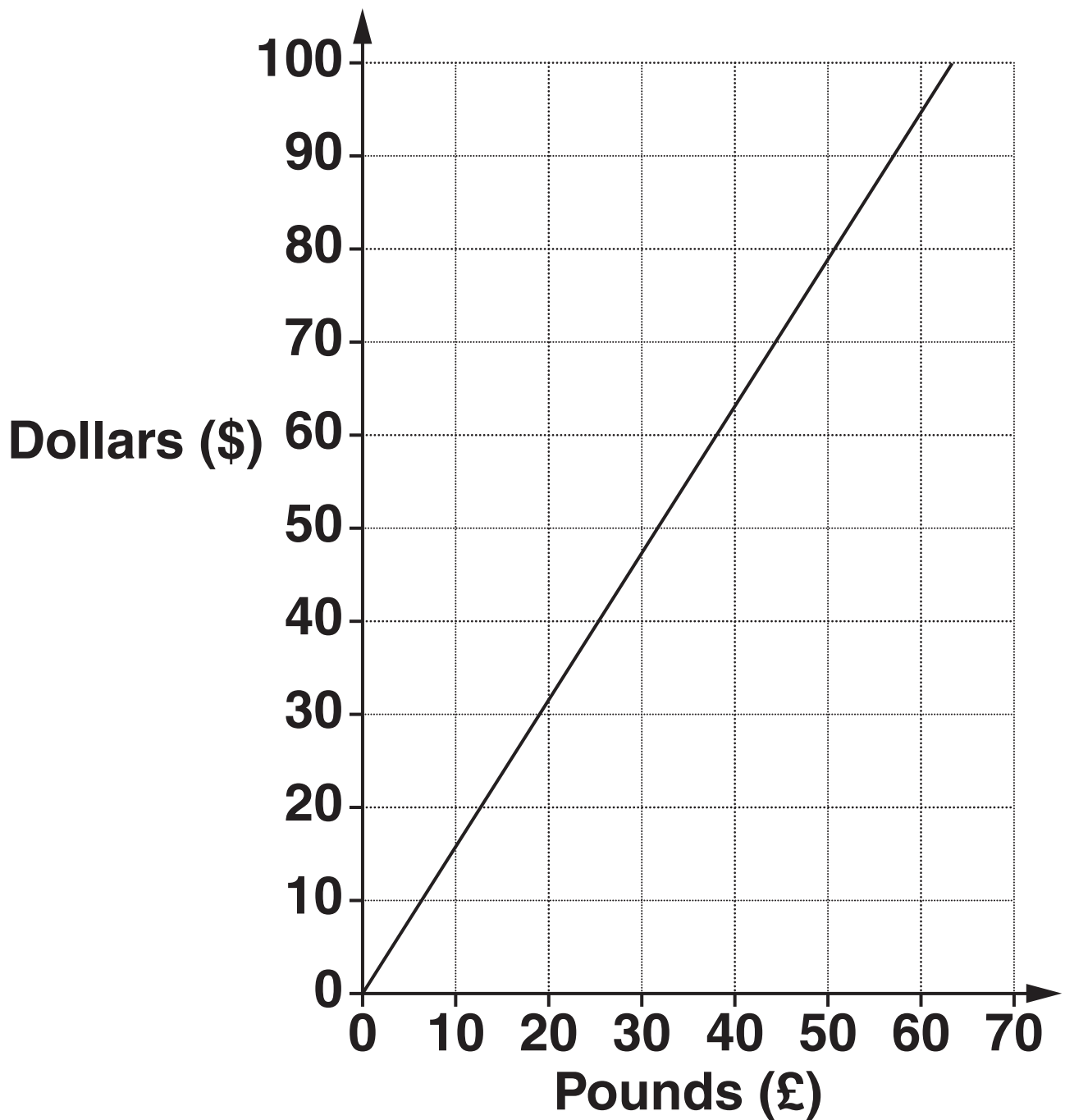
$$G = \frac{C}{14} - 121$$

$$G = 14C - 121$$

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

[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.**

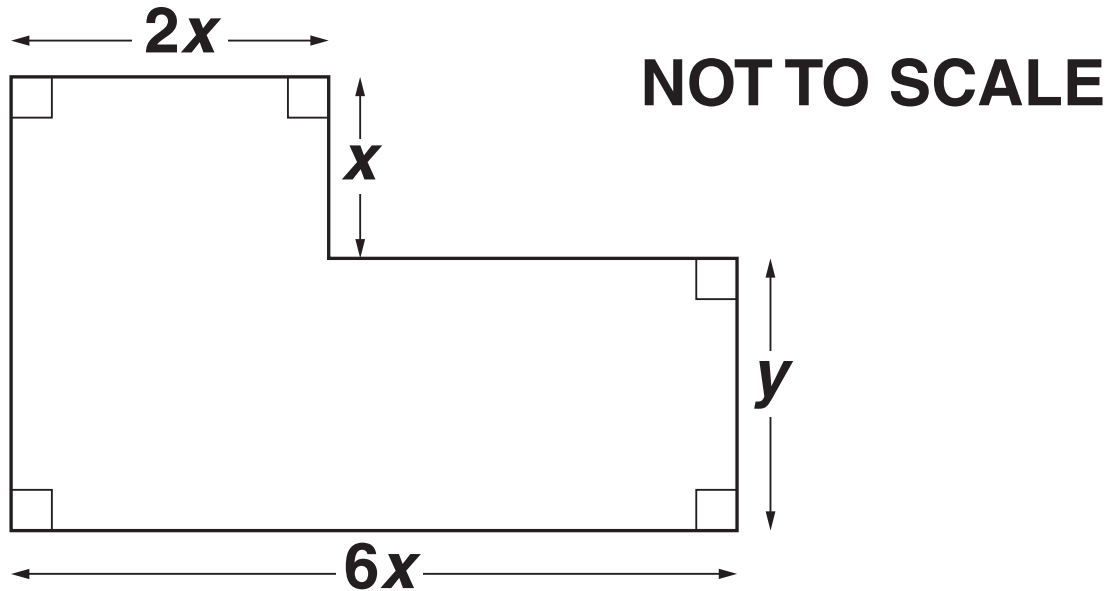
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[2]

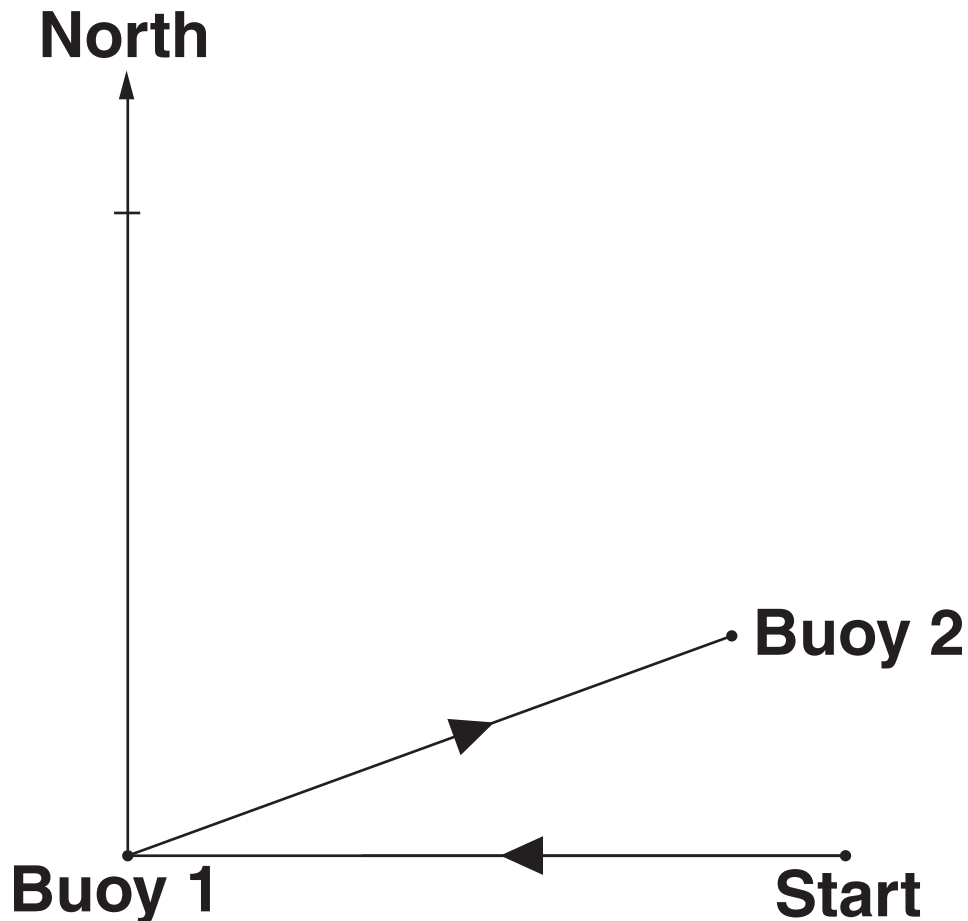
- 11 Write down an expression for the perimeter of the shape below.  
Give your answer in its simplest form.



[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?**

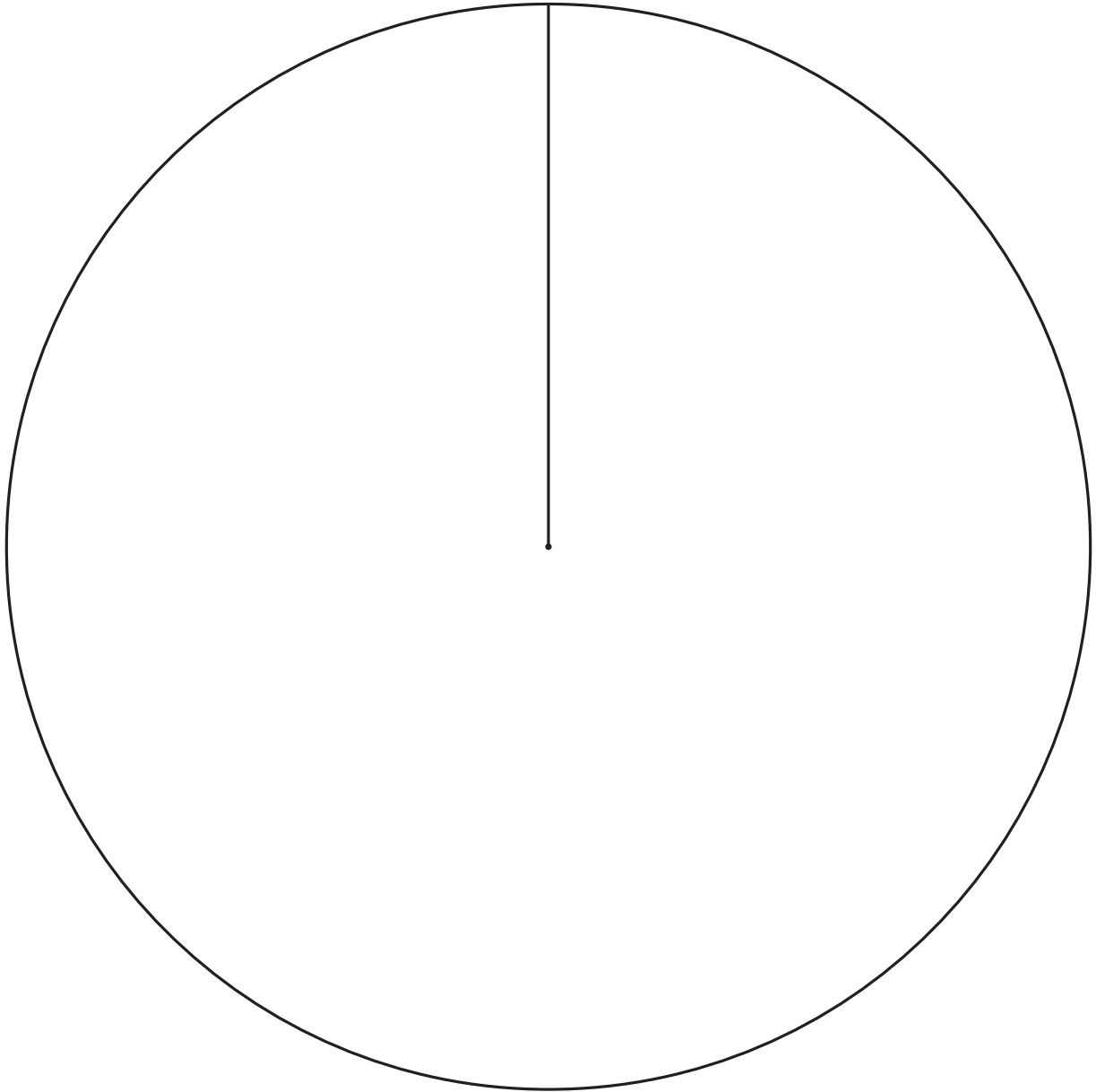
\_\_\_\_\_

\_\_\_\_\_ [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.**

|                               |           |
|-------------------------------|-----------|
| <b>Education</b>              | <b>45</b> |
| <b>Social Services</b>        | <b>21</b> |
| <b>Environmental Services</b> | <b>15</b> |
| <b>Other Services</b>         | <b>9</b>  |

**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.**

|              |                         |
|--------------|-------------------------|
| <b>box A</b> | <b>8 red, 4 yellow</b>  |
| <b>box B</b> | <b>9 red, 6 yellow</b>  |
| <b>box C</b> | <b>5 red, 2 yellow</b>  |
| <b>box D</b> | <b>5 red, 7 yellow</b>  |
| <b>box E</b> | <b>14 red, 6 yellow</b> |

**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]**

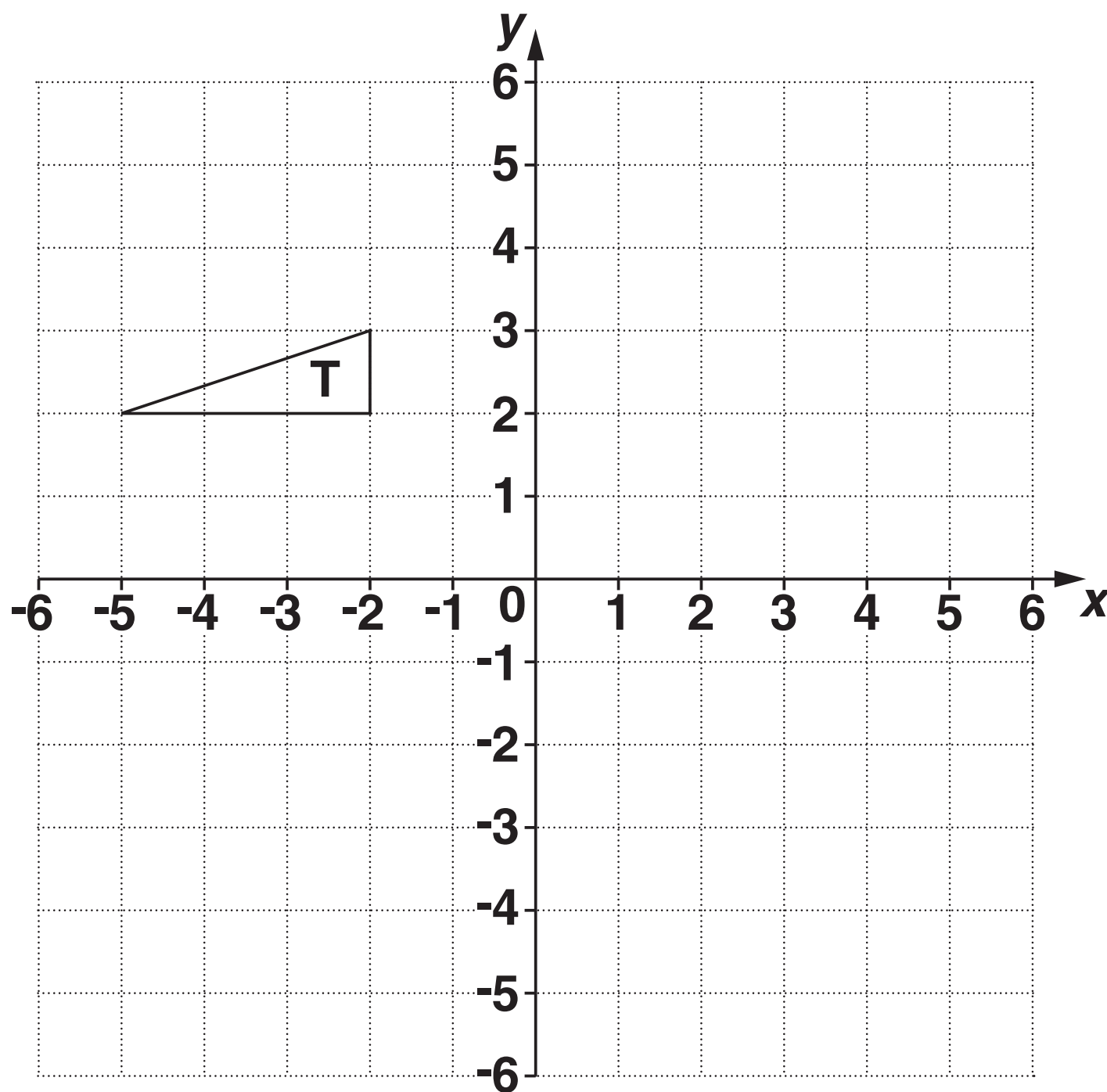
**(d) If the probability that she takes a red counter is 60%, which box did she take it from?**

**(d) box\_\_\_\_\_ [1]**



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17 Triangle T is drawn on the grid below.



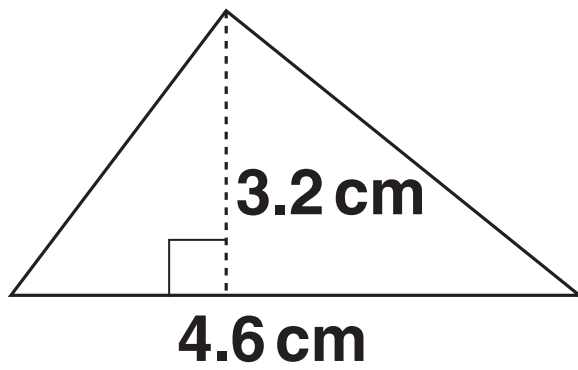
**(a) Translate triangle T by  $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$ .**

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

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

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

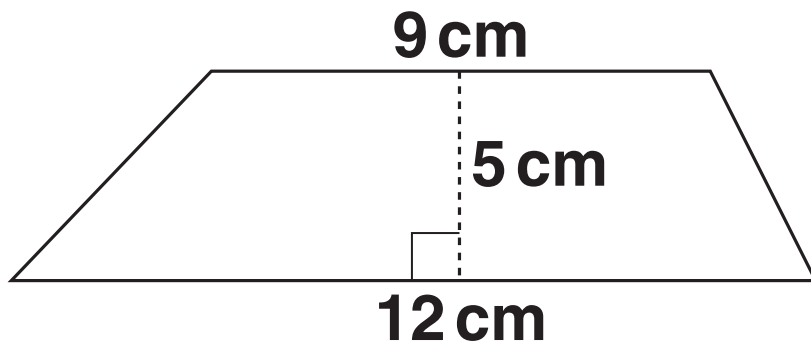
**18 (a) Work out the area of this triangle.**



**NOT TO SCALE**

**(a) \_\_\_\_\_ cm<sup>2</sup> [2]**

**(b) Work out the area of this trapezium.**



**NOT TO SCALE**

**(b) \_\_\_\_\_ cm<sup>2</sup> [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**

$$3570 \div 0.93 = 3391.5$$

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

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**[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.**

| <b>Number of spins</b>          | <b>10</b> | <b>50</b> | <b>200</b> |
|---------------------------------|-----------|-----------|------------|
| <b>Number of times 3 scored</b> | <b>4</b>  | <b>18</b> | <b>76</b>  |
| <b>Relative frequency</b>       |           |           |            |

- (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.**

| <b>NUMBER OF<br/>TIMES LATE</b> | <b>FREQUENCY</b> |  |
|---------------------------------|------------------|--|
| <b>0</b>                        | <b>11</b>        |  |
| <b>1</b>                        | <b>8</b>         |  |
| <b>2</b>                        | <b>6</b>         |  |
| <b>3</b>                        | <b>0</b>         |  |
| <b>4</b>                        | <b>3</b>         |  |
| <b>5</b>                        | <b>2</b>         |  |

**Work out the mean number of times late.**

**(a) \_\_\_\_\_ [3]**  
**50**

**(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.**

|                    |                     |                |
|--------------------|---------------------|----------------|
| <b>Autumn term</b> | <b>140 sessions</b> | <b>24 late</b> |
| <b>Spring term</b> | <b>116 sessions</b> | <b>19 late</b> |
| <b>Summer term</b> | <b>128 sessions</b> | <b>15 late</b> |

**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**

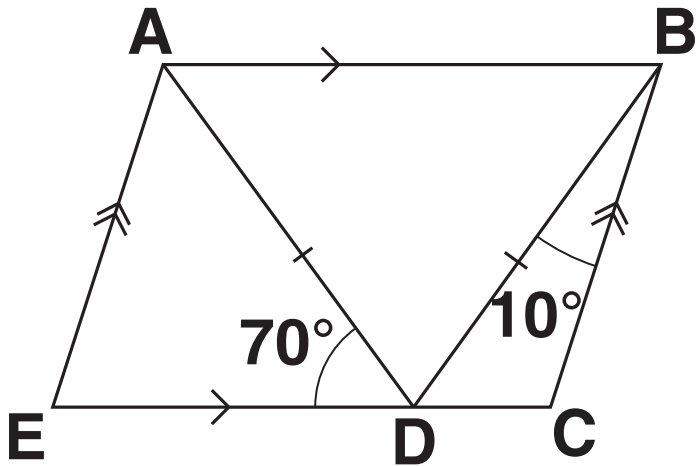
**2**

**-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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