OCR
RECOGNISING ACHIEVEMENT

F

Tuesday 11 June 2013 – Morning

GCSE MATHEMATICS B

J567/01 Paper 1 (Foundation Tier)

J517110613

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
- Geometrical instruments
- Tracing paper (optional)

Duration: 1 hour 30 minutes

J567701

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. 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).
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is **100**.
- This document consists of **24** pages. Any blank pages are indicated.

WARNING

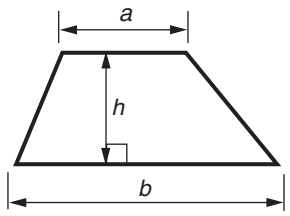
No calculator can be used for this paper

This paper has been pre modified for carrier language

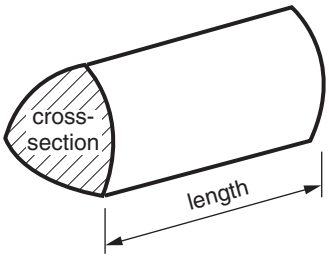
DC (NH/KN) 65345/4

Formulae Sheet: Foundation Tier

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

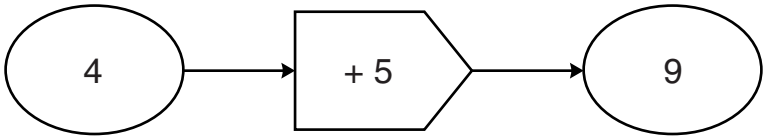


Volume of prism = (area of cross-section) × length



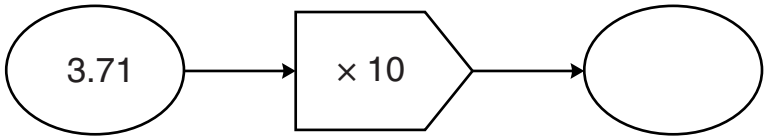
PLEASE DO NOT WRITE ON THIS PAGE

1 This is a function machine.



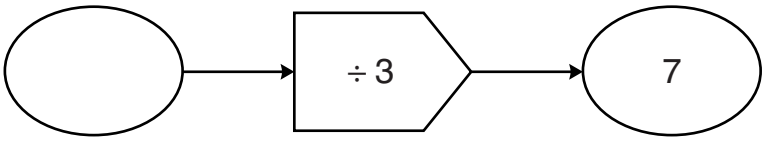
Complete each of these function machines.

(a)



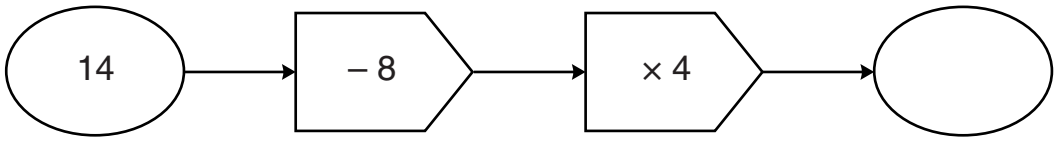
[1]

(b)



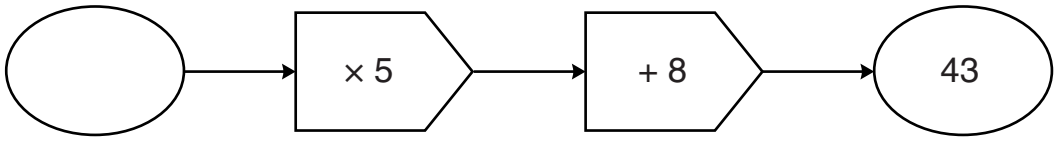
[1]

(c)



[1]

(d)



[1]

2 A farmer has 191 sheep and a number of lambs.

- 19 sheep have 3 lambs each.
- 117 sheep have 2 lambs each.
- All the other sheep have 1 lamb each.

How many lambs are there altogether?

_____ **[4]**

3 **(a)** Write down the metric unit you would use to measure

(i) the distance from London to Manchester,

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

(ii) the weight of a ten pence coin.

(ii) _____ **[1]**

(b) **(i)** How many millimetres are there in 17 cm?

(b)(i) _____ mm **[1]**

(ii) How many grams are there in 2.5 kg?

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

4 Sixty Year 11 students were asked what they were planning to do next year.

(a) The results are collected in this table.

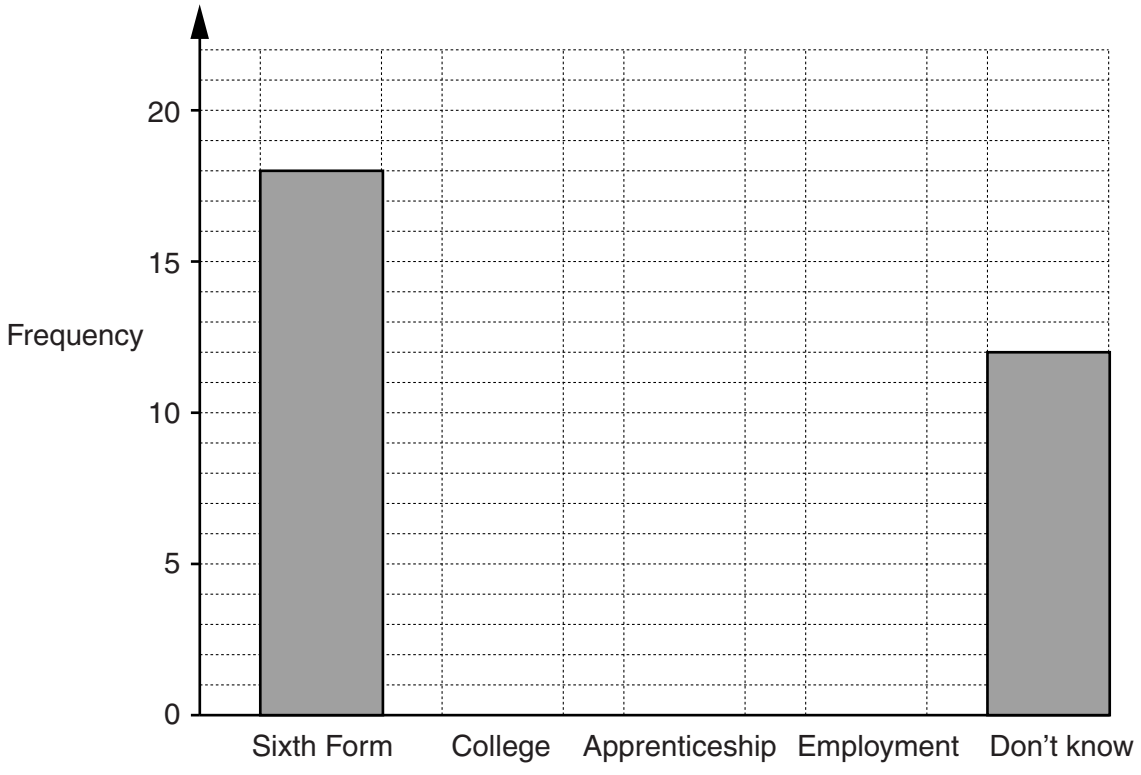
Complete the table by filling in the boxes.

	Tally	Frequency
Sixth Form	𝍸 𝍸 𝍸 III	18
College	𝍸 𝍸 𝍸 𝍸	
Apprenticeship	III	3
Employment	𝍸 II	7
Don't know		12

[2]

(b) The results are displayed in this bar chart.

Complete the bar chart.



[2]

(c) How many students **do** know what they are planning to do next year?

(c) _____ **[1]**

5* Samit is going to visit his mother in Birmingham.
He can travel by car or he can take a train and a taxi.

Car Journey	Train and Taxi Journey
Distance 160 miles Petrol costs 30p a mile	Train ticket costs £38 Taxi costs £2, plus £1 for every quarter of a mile Taxi journey distance $1\frac{1}{2}$ miles

Advise Samit which is the cheaper way he can travel to Birmingham and state how much he will save.

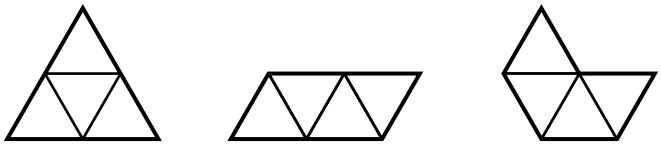
_____

_____ **[5]**

6 **(a)** Harry is finding different ways that he can arrange four equilateral triangles edge to edge. The triangles all have a side of length 1 cm.

1 cm

He makes three different shapes.



Shape A Shape B Shape C

(i) How many lines of symmetry does each shape have?

Shape A _____, Shape B _____, Shape C _____ **[2]**

(ii) What is the order of rotation symmetry of each shape?

Shape A _____, Shape B _____, Shape C _____ **[2]**

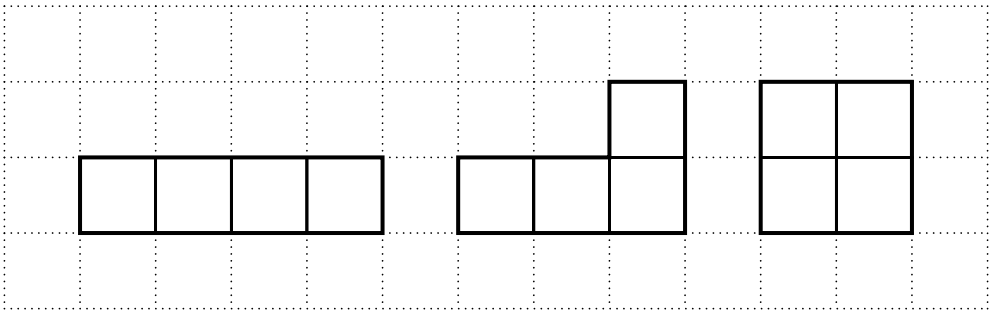
(iii) What is the perimeter of Shape C?

(a)(iii) _____cm **[1]**

(b) Megan is finding all the different ways she can arrange four squares edge to edge. The squares all have a side of length 1 cm.

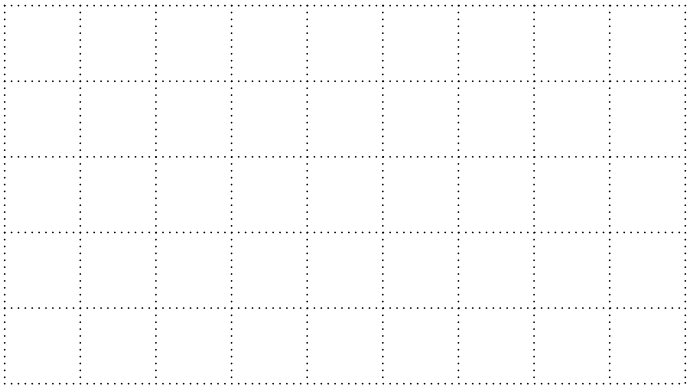
1 cm

She makes three different shapes.



(i) Megan finds a new, different, shape made with four squares joined edge to edge.
This shape has one line of symmetry and no rotation symmetry.

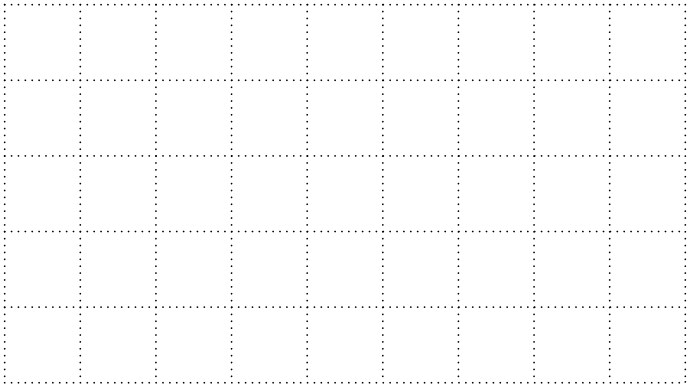
Draw this shape on the grid.



[1]

(ii) She finds another new, different, shape made with four squares joined edge to edge.
This shape has no line of symmetry and rotation symmetry of order 2.

Draw this shape on the grid.



[1]

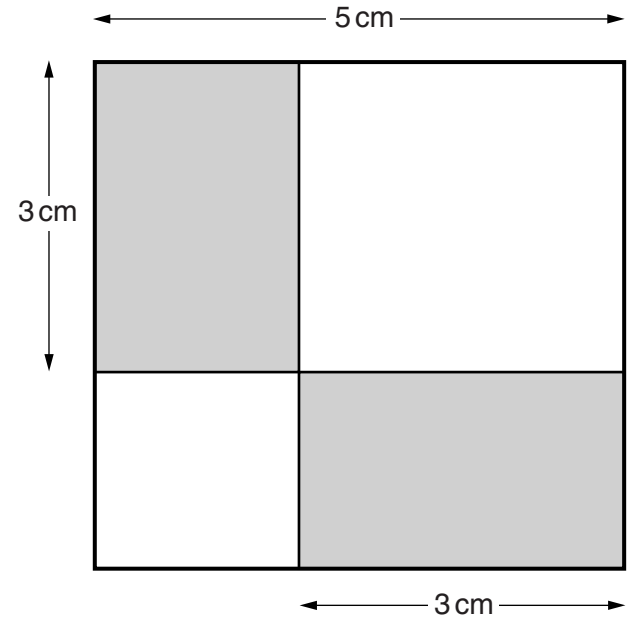
(iii) What is the smallest perimeter of shapes made with four squares joined edge to edge?

(b)(iii) _____cm **[1]**

(iv) What is the largest perimeter of shapes made with four squares joined edge to edge?

(iv) _____cm **[1]**

7 This shape is a square with two shaded rectangles.



Not to scale

What fraction of the shape is shaded?

_____ **[4]**

8 **(a)** Here are the first five terms in a sequence.

3 6 9 12 15

(i) What is the next term in the sequence?

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

(ii) What is the 100th term in the sequence?

(ii) _____ **[1]**

(b) Here are the first five terms in a different sequence.

31 27 23 19 15

(i) What is the next term in the sequence?
Explain how you worked it out.

_____ because _____

_____ **[2]**

(ii) The 17th term in the sequence is $^{-}33$.

What is the 18th term in the sequence?

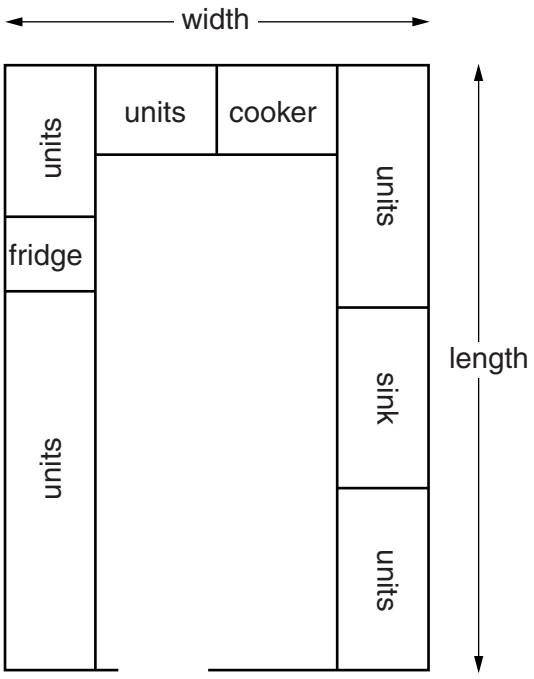
(b)(ii) _____ **[1]**

(iii) The 50th term in the sequence is $^{-}165$.

What is the 48th term in the sequence?

(iii) _____ **[1]**

9 This is a scale drawing of Ella's kitchen.



Scale: 2 cm represents 1 m

(a) Complete these statements.

The real length of Ella's kitchen is _____ m.

The real width of Ella's kitchen is _____ m. **[3]**

(b) Ella wants to buy a new cooker.
The width of the new cooker is 95 cm.

Will the new cooker fit in the space left by taking out the old cooker?
Show how you decide.

_____

_____ **[1]**

10 (a) Seven students each grow a sunflower for their science project.
They each measure the height of their sunflower in metres.
These are their results.

2.1 2.3 1.7 2.3 2.0 2.5 2.2

(i) Work out the median height.

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

(ii) Work out the range of the heights.

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

(iii) What is the mode of the heights?

(iii) _____ m **[1]**

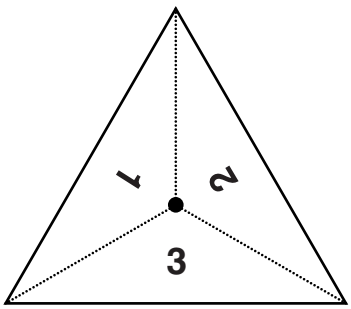
(b) Six different students also grow sunflowers and measure the height of each sunflower:

- the lowest height is 1.8 m
- the range is 0.8 m
- there are two modes, 2.1 m and 2.4 m.

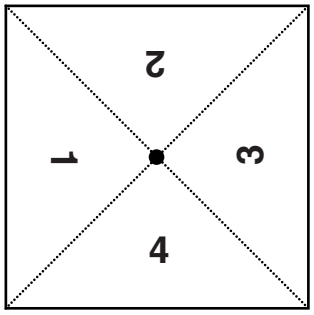
What are the heights of the six sunflowers?

(b) _____, _____, _____, _____, _____, _____ m **[2]**

11 In a game there are two fair spinners.
The yellow spinner has three sides numbered 1 to 3.
The red spinner has four sides numbered 1 to 4.



yellow



red

Jane spins both spinners.

(a) Complete the table of all the possible outcomes.

You may not need to use all the lines.

yellow	red
1	1
1	2

[2]

(b) What is the probability that Jane gets a 2 on the yellow spinner **and** a 3 on the red spinner?

(b) _____ **[1]**

(c) Jane adds together the two numbers that she gets.

(i) What is the probability that Jane gets a total of 4?

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

(ii) What is the probability that Jane gets a total of 8?

(ii) _____ **[1]**

12 (a) The temperature at midnight in a greenhouse is $^{-}4\,°C$.
By midday the temperature has risen 7 degrees.

What is the temperature in the greenhouse at midday?

(a) _____ °C **[1]**

(b) Work out.

(i) $^{-}5 - {}^{-}3$

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

(ii) $^{-}7 \times {}^{-}4$

(ii) _____ **[1]**

13 **(a)** Round 51.376

(i) to 2 decimal places,

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

(ii) to 1 significant figure.

(ii) _____ **[1]**

(b) A garden centre buys 72 plants.
The plants cost £3.94 each.

Estimate the total cost of the plants.
Show how you get your answer.

(b) £ _____ **[2]**

14 **(a)** Work out, giving your answer as simply as possible.

$$\frac{2}{3} - \frac{1}{6}$$

(a) _____ **[2]**

(b) Work out, giving your answer as a mixed number.

$$\frac{3}{4} + \frac{2}{5}$$

(b) _____ **[3]**

15 The length of a rectangle is 10 cm longer than the width.
The width of the rectangle is x cm.

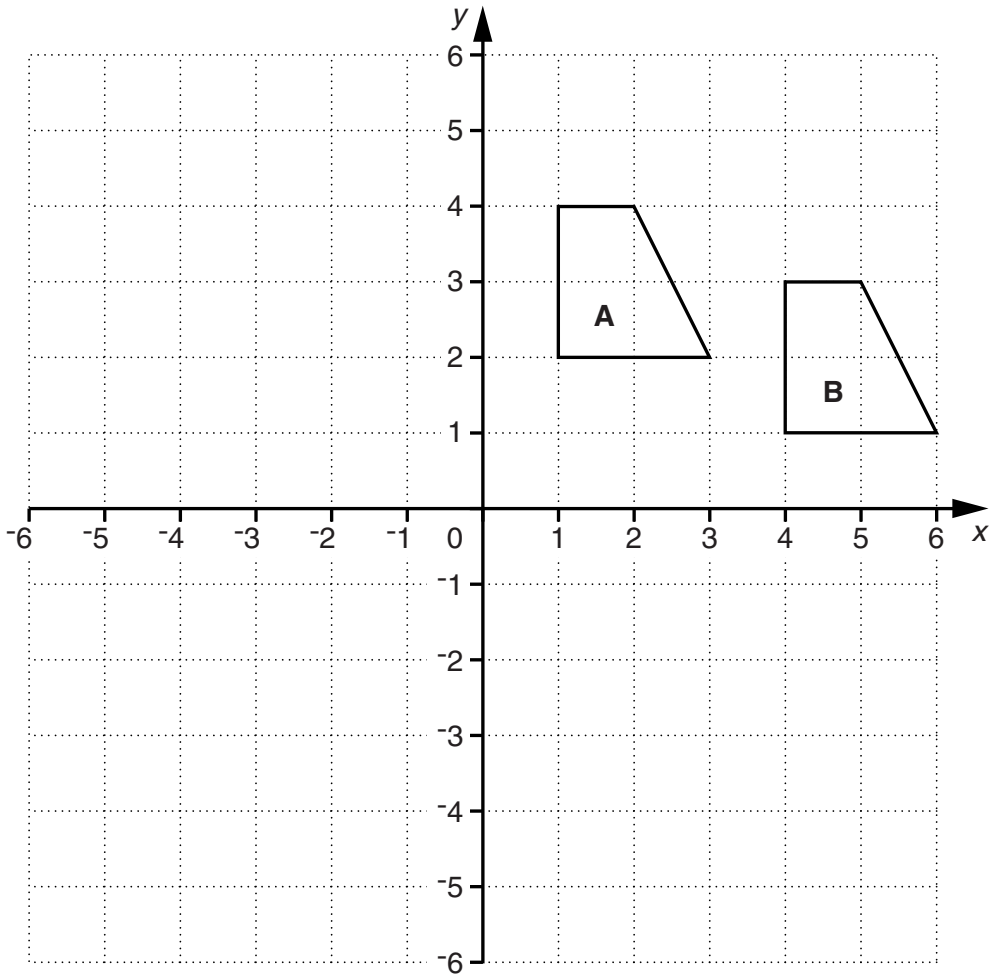
(a) Write down an expression for the length of the rectangle.

(a) _____cm **[1]**

(b) Write down and simplify an expression for the perimeter of the rectangle.

(b) _____cm **[2]**

16 Here is a coordinate grid.



(a) Describe fully the single transformation that maps trapezium **A** onto trapezium **B**.

_____

_____ **[2]**

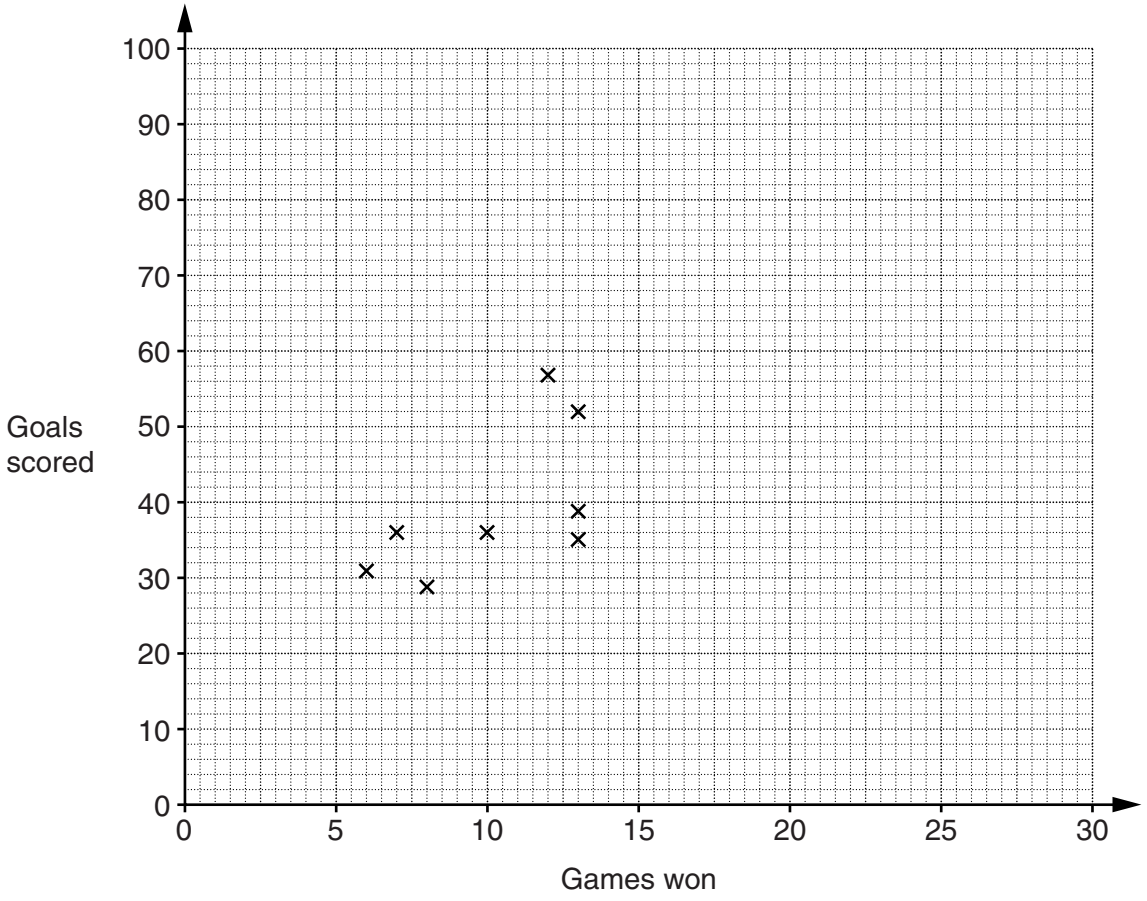
(b) Rotate trapezium **A** 90° anticlockwise about the origin.
Label the image **C**.

Reflect image **C** in the *x*-axis.
Label the image **D**. **[4]**

17 The table shows the number of games won and the number of goals scored by 12 teams in one season in a football league.

Games won	6	7	8	10	12	13	13	13	15	17	25	26
Goals scored	31	36	29	36	57	35	39	52	58	55	75	82

The information for the first eight teams is plotted on the scatter graph.



(a) Complete the scatter graph. **[2]**

(b) **(i)** Draw a line of best fit. **[1]**

(ii) Use your line of best fit to estimate the number of goals scored by a team that won 20 games in the season.

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

18 **(a)** Work out the value of $x^2 - 3x$ when

(i) $x = 5$,

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

(ii) $x = -4$.

(ii) _____ **[2]**

(b) Multiply out.

$y(y + 5)$

(b) _____ **[1]**

(c) Factorise fully.

$4p^2 - 8p$

(c) _____ **[2]**

19 The scale diagram shows the positions of two towns, A and B.

Scale: 1 cm represents 2 km

A new business park is to be built near to these towns.

The business park will be:

- closer to town A than town B
- no more than 14 km from town B.

Construct and shade the region where the business park could be built.
Leave in all your construction lines. **[4]**

20 (a) On weekdays it costs £6.50 per hour to hire a tennis court at Meadway Tennis Club.
On Saturdays the cost is 30% more.

How much does it cost to hire a court for 2 hours on a Saturday?

(a) £ _____ **[3]**

(b) At a junior coaching session the ratio of boys to girls is 3 : 5.
There are 40 children at the coaching session.

Work out the number of boys and the number of girls at the coaching session.

(b) _____ boys _____ girls **[2]**

TURN OVER FOR QUESTION 21

21 Catalin works in an office.
One week he divides his time between these tasks:

- $\frac{1}{4}$ of his time in meetings
- $\frac{5}{8}$ of his time writing reports
- the rest of his time doing the accounts.

He spends a total of 6 hours doing the accounts.

Find the total number of hours he works in the week.

_____ hours **[4]**

END OF QUESTION PAPER