OCR
Oxford Cambridge and RSA

F

Thursday 4 June 2015 – Morning

GCSE MATHEMATICS B

J567/02   Paper 2 (Foundation Tier)

Duration: 1 hour 30 minutes

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).
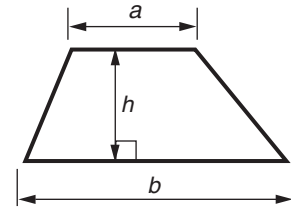* Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

* The number of marks is given in brackets **[ ]** at the end of each question or part question.
* Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
* Quality of written communication is assessed in questions marked with an asterisk (*).
* The total number of marks for this paper is **100**.
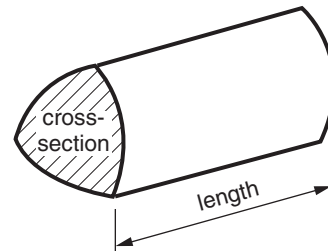* This document consists of **24** pages. Any blank pages are indicated.

☑ **You are permitted to use a calculator for this paper**

OCR is an exempt Charity

Turn over
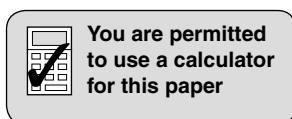
Formulae Sheet: Foundation Tier

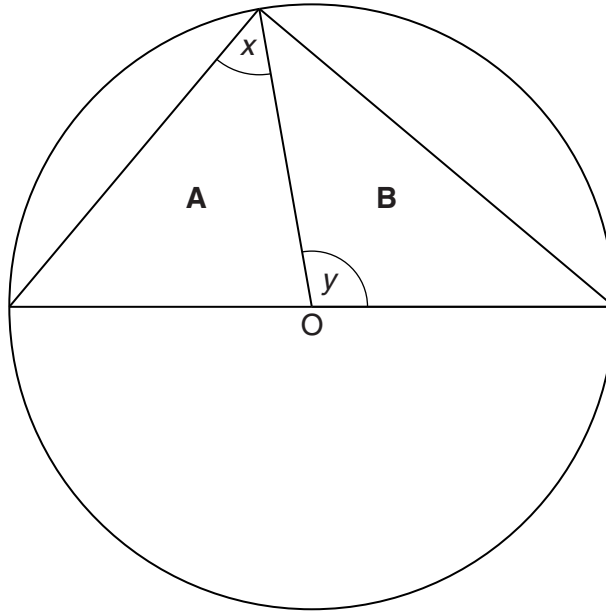**Area of trapezium** $= \frac{1}{2}(a + b)h$

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

PLEASE DO NOT WRITE ON THIS PAGE

Answer **all** the questions.

1 The diagram shows a circle, centre O, that contains two triangles **A** and **B**.

(a) Measure and write down the radius of the circle.

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

(b) (i) Measure and write down angle *x*.

(b)(i) _____ ° **[1]**

(ii) Measure and write down angle *y*.

(ii) _____ ° **[1]**
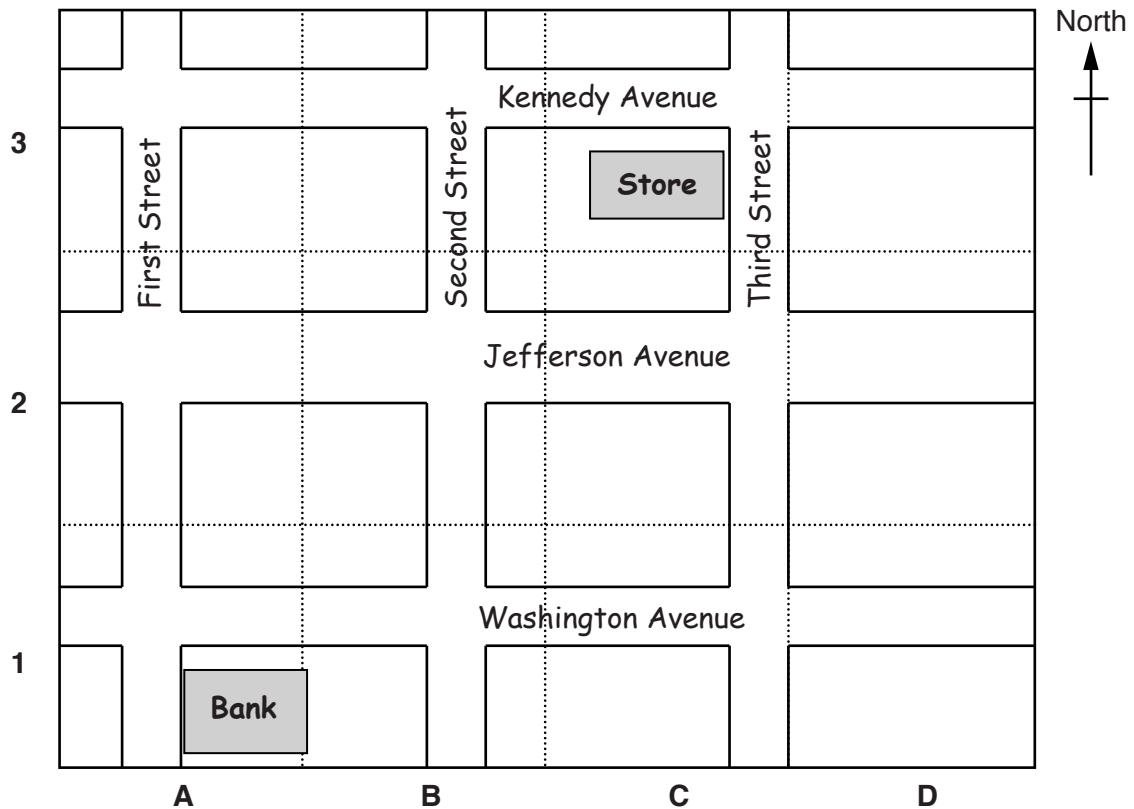
(c) Complete each of the following statements using a term from the list.

> reflex   equilateral   acute   isosceles
>
> a right angle   obtuse   scalene

(i) Angle *y* is _____ . **[1]**

(ii) Triangle **B** is _____ . **[1]**

Turn over

2   This map shows part of a town in America.

Madison walks from the Bank to the Store.

(a) Complete this description of Madison's walk.

Madison leaves the Bank at grid reference A1.

She walks along First Street in the direction North.

Madison turns right onto Jefferson Avenue.

She walks along Jefferson Avenue in the direction _____ .

Madison turns _____ onto Third Street towards the store.

She walks along Third Street in the direction North.

She arrives at the Store at grid reference _____ .   **[3]**

(b) Choose one of the following distances to complete the sentence below.

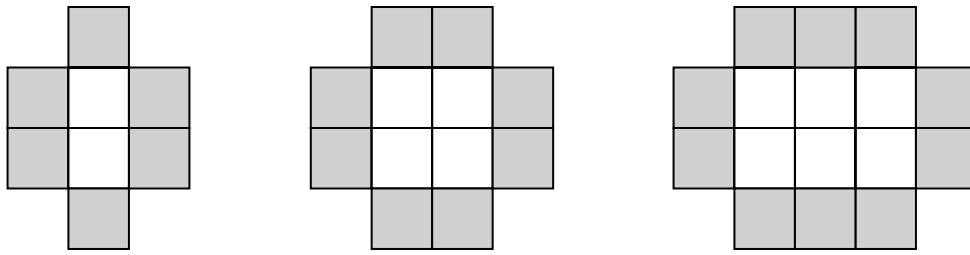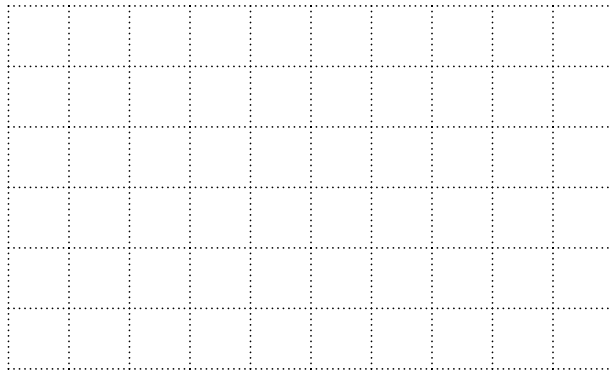| 6800 mm | 6.8 km | 680 m | 68 m |

Madison takes 14 minutes to walk a distance of _____ from the Bank to the Store.   **[1]**

3 Gary draws this sequence of patterns of white and grey squares.

(a) Draw the next pattern in the sequence on the grid below.

[1]

(b) Complete this table.

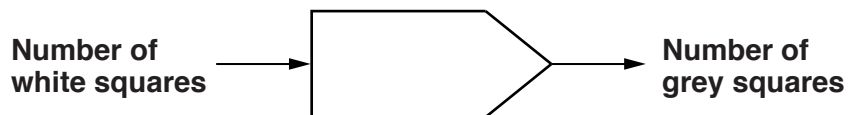| Number of white squares	2	4	6	8	10
Number of grey squares	6	8	10		

[1]

(c) The sequence is continued.

How many grey squares will there be with 16 white squares?

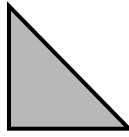**(c)** _____ [1]

(d) Complete the rule for this sequence.

Number of white squares → ⬡ → **Number of grey squares**

[1]

(e) How many **white** squares will there be in a pattern with 96 **grey** squares?

(e) _____ [1]

Turn over

4 Shezana has a set of tiles all of this shape and size.

She joins **two** tiles, edge to edge, to make a triangle.
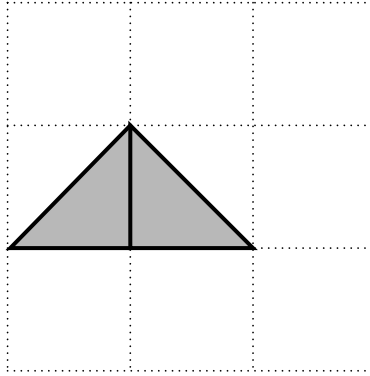
(a) Draw a parallelogram, which is not a square, using **two** of these tiles, edge to edge, on the grid below.
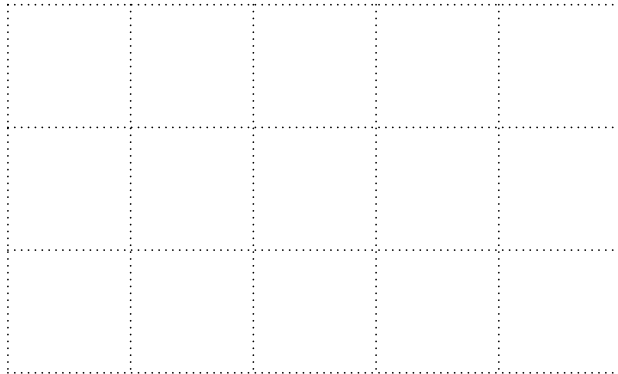
[1]

(b) Draw a rectangle, which is not a square, using **four** of these tiles, edge to edge, on the grid below.

[1]

(c) Draw a square using **four** of these tiles, edge to edge, on the grid below.

[1]

(d) Draw a trapezium using **three** of these tiles, edge to edge, on the grid below.

[1]

Turn over

5 This graph shows the record maximum and record minimum temperatures in England and Wales for March, June, September and December in the last 50 years.
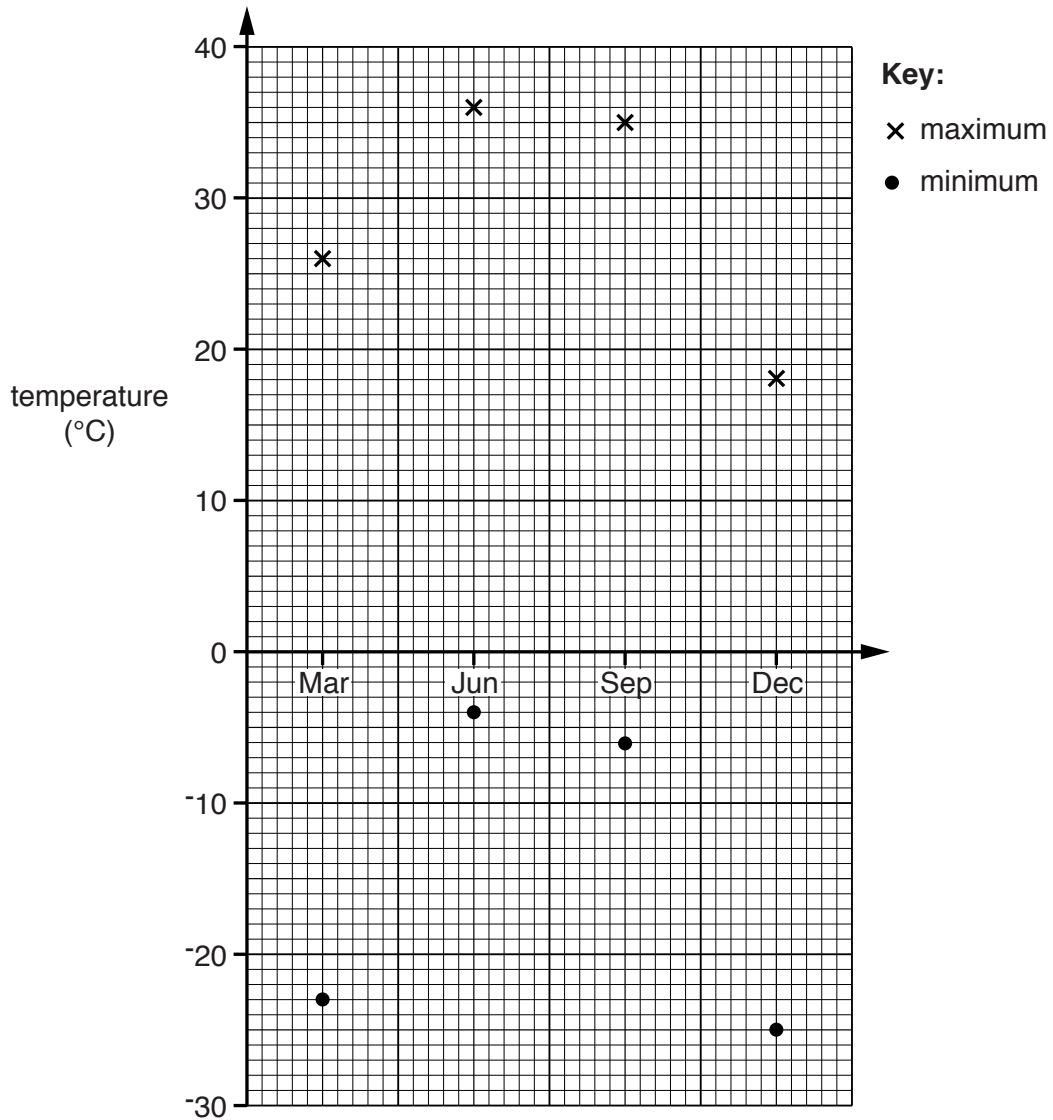
(a) What was

  (i) the record maximum temperature in June,

  (a)(i) _____ °C **[1]**

  (ii) the record minimum temperature in March?

  (ii) _____ °C **[1]**

(b) Describe how the record minimum temperature varied from March through to December.

  _____

  _____

  _____ **[2]**

(c) How much warmer was the record maximum temperature in September than the record maximum temperature in December?

(c) _____ °C **[1]**

(d) What is the difference between the record maximum and record minimum temperatures in September?

(d) _____ °C **[1]**

6 Glyn, Mark and Clare are making bread rolls.
This is the list of ingredients for their recipe.

Ingredients to make **12** bread rolls
350 g   flour
20 g   butter
230 ml   water
2 teaspoons   yeast
1 teaspoon   salt

(a) Glyn is going to make 36 bread rolls.

How many teaspoons of yeast will he need?

(a) _____ **[1]**

(b) Mark is going to make 30 bread rolls.

How much flour will he need?

(b) _____ g **[2]**

(c) Clare has 80 g of butter. She has plenty of all the other ingredients.

What is the greatest number of bread rolls that she can make?

(c) _____ **[2]**

7 **(a)** Complete this table of equivalent fractions, decimals and percentages.

	Fraction		Decimal		Percentage
	$\frac{1}{2}$	=	0.5	=	
	$\frac{3}{4}$	=		=	
		=		=	97%
		=	0.03	=	

[4]

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

(i) $\frac{1}{2} + \frac{1}{4}$

(b)(i) _____ [1]

(ii) $\frac{5}{7} - \frac{1}{14}$

(ii) _____ [2]

(c) Work out.

76% of 480

(c) _____ [2]

8 (a) Work out.

$$5^2 - 3^2$$

(a) _____ **[2]**

(b) (i) Complete this pattern by filling in the missing numbers.

$3^2 - 1^2 =$ 2×4

$4^2 - 2^2 =$ 2×6

$5^2 - 3^2 =$ $2 \times$ _____

$6^2 - 4^2 =$ _____ $\times$ _____   **[2]**

(ii) This is another line from the pattern.

$100^2 - 98^2 =$ _____ $\times$ _____

Complete the line by filling in the missing numbers.   **[1]**

9 A school is organising a trip to a theme park for Year 10 pupils.
The school says there must be three teachers on each bus to supervise the pupils.
There are 228 pupils going on the trip.
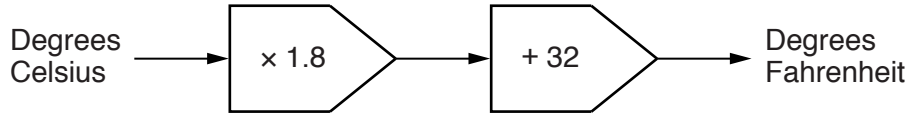Each bus can take 46 passengers.

What is the number of teachers needed?
Show how you obtain your answer.

_____ **[4]**

10 John and Michelle are going on holiday to Nice.

(a) The temperature in Nice is 30° Celsius.
Michelle wants to know what this temperature is in degrees Fahrenheit.
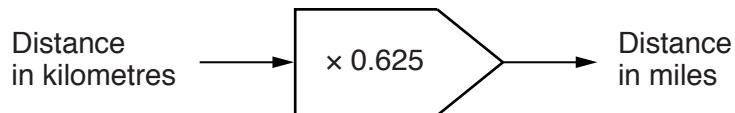
Use the rule to find 30° Celsius in degrees Fahrenheit.

Degrees Celsius → × 1.8 → + 32 → Degrees Fahrenheit

(a) _____ °F **[2]**

(b) The distance from London to Nice is 850 miles.

This rule converts a distance in **kilometres** to a distance in **miles**.

Distance in kilometres → × 0.625 → Distance in miles

Work out the distance from London to Nice in **kilometres**.
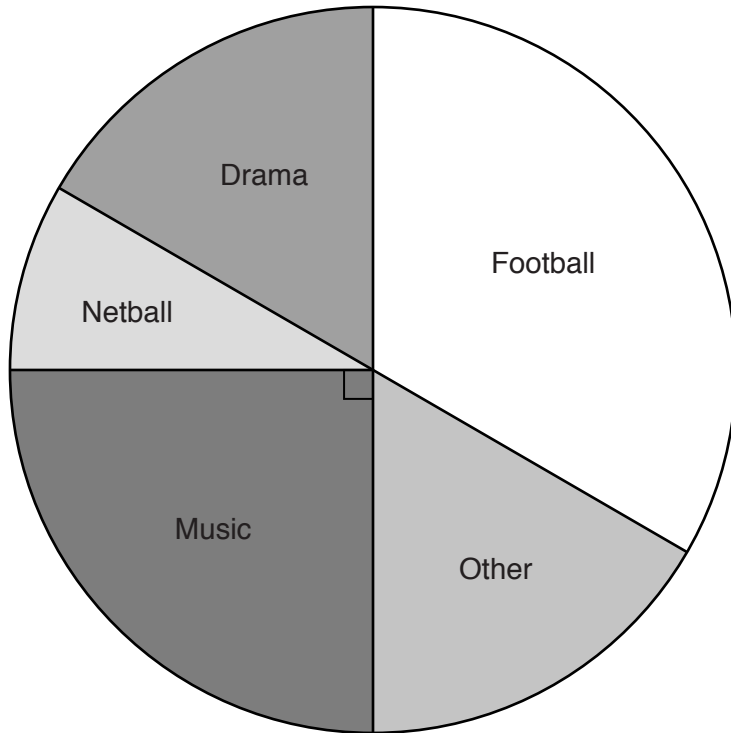
(b) _____ km **[1]**

(c) John changes some money.
For every £1 that he changes, he receives 1.12 euros.
John changes £300.

How many euros does he receive?

(c) _____ euros **[2]**

11 48 students were asked which is their favourite leisure activity.
The results are recorded in this pie chart.

(a) Which leisure activity is the mode?

(a) _____ **[1]**

(b) How many students said Music?

(b) _____ **[2]**

(c) How many students said Drama?

(c) _____ **[2]**

12 Ewan has 12 yoghurts in his fridge.

This table shows the number of yoghurts of each flavour in his fridge.

Flavour	Number of yoghurts
Chocolate	6
Strawberry	3
Lemon	2
Vanilla	1

Ewan takes a yoghurt, at random, from the fridge.

(a) What is the probability that the flavour is

  (i) vanilla,

(a)(i) _____ **[1]**
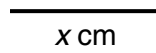
  (ii) banana?

(ii) _____ **[1]**

(b) Complete these sentences.

The probability that the flavour is _____ is $\frac{1}{2}$.
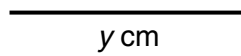
The probability that the flavour is _____ is $\frac{1}{4}$.　　　　**[2]**

13 Marta has a collection of short rods and long rods.

The short rods have a length of x cm.

$\overline{}$
x cm

The long rods have a length of y cm.
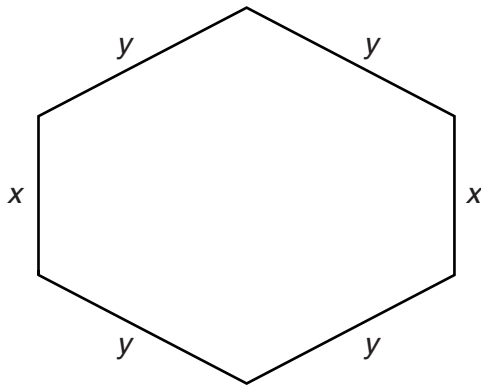
$\overline{}$
y cm

(a) Marta makes a regular polygon with some short rods.
The formula for the perimeter, P cm, of this polygon is

$$P = 5x.$$

What is the mathematical name of this polygon?

(a) _____ **[1]**

(b) Marta makes a hexagon with some short rods and some long rods.

Complete the formula for the perimeter, P cm, of this hexagon.
Give your answer as simply as possible.

(b) $P =$ _____ **[2]**

(c) Marta makes an isosceles triangle with three of the rods.

Complete the formula for the perimeter, P cm, of an isosceles triangle.
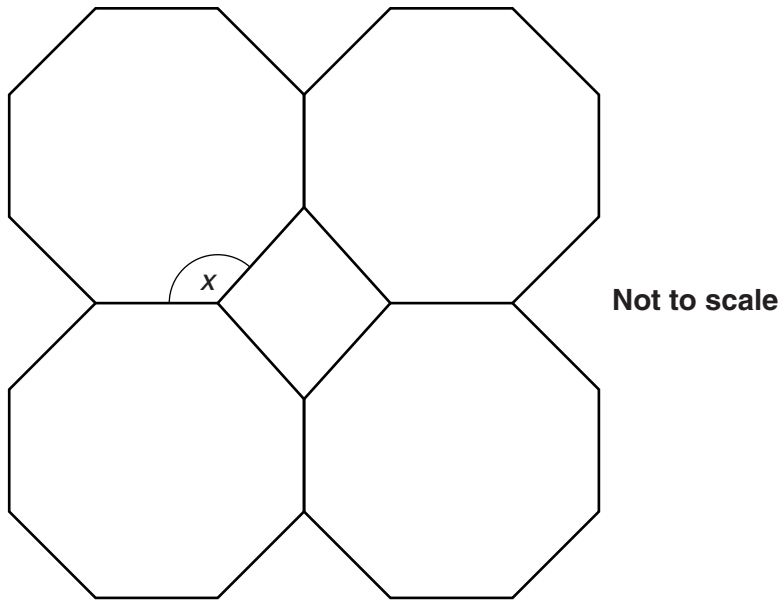
(c) $P =$ _____ **[1]**

(d) Marta makes a kite, which is not a rhombus, with four of the rods.

Complete the formula for the perimeter, P cm, of this kite.

(d) $P =$ _____ **[1]**

14* This sketch shows four identical regular octagons and a square.

Not to scale

Work out angle *x*.
Give a reason for each step of your working.

_____ ° **[4]**

Turn over

15 A supermarket gives £800 every month to local charities.
The amount given to each charity is in proportion to the number of votes given by customers.

In October there were 1200 votes altogether, given as follows:

- Children's Hospice – 600 votes
- Outings for the Elderly Club – 420 votes
- Sports Club – 180 votes.

How much did each of these charities receive in October?

Children's Hospice £ _____

Outings for the Elderly Club £ _____

Sports Club £ _____ **[3]**

16 (a) Calculate.

$$\frac{4.95 + 1.64}{2.61 \times 1.57}$$

Give your answer correct to two decimal places.

(a) _____ **[2]**

(b) Work out the value of $2m - 4n$ when $m = 1.8$ and $n = {}^-0.7$.

(b) _____ **[2]**

(c) Write $\frac{7}{9}$ as a recurring decimal.

(c) _____ **[1]**

Turn over

17 Kyle is investigating how much he used his mobile phone in one month.

(a) The stem and leaf diagram shows the number of text messages Kyle sent each of the 30 days.

0	3	3	4	5	7	7	9	9		
1	0	0	1	2	3	4	4	5	5	6	7
2	3	5	5	6	9					
3	1	4	8							
4	2	6	9							

Key: 4 │ 2 represents 42 texts

(i) Write down the largest number of texts Kyle sent in one day.

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

(ii) Find the median number of texts he sent in one day.

(ii) _____ texts **[2]**

(iii) On what fraction of the days did Kyle send more than 40 texts?
Give your answer in its simplest form.

(iii) _____ **[2]**

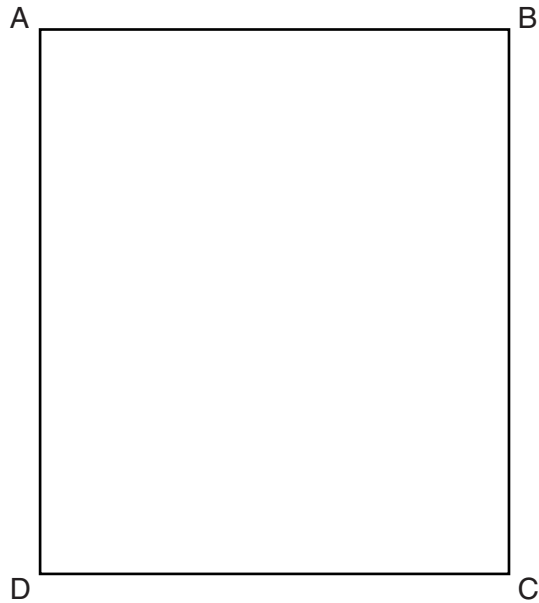**(b)** The table below summarises the lengths of Kyle's phone calls during the month.

Length of call (t minutes)	Frequency		
$0 < t \le 2$	19		
$2 < t \le 4$	12		
$4 < t \le 6$	8		
$6 < t \le 8$	7		
$8 < t \le 10$	4		

Calculate an estimate of the mean length of a call.

(b) _____ minutes **[4]**

18 The scale drawing shows a garden ABCD.

Scale: 1 cm represents 2 m

```
      A                                    B
      ┌────────────────────────────────────┐
      │                                    │
      │                                    │
      │                                    │
      │                                    │
      │                                    │
      │                                    │
      │                                    │
      │                                    │
      │                                    │
      │                                    │
      │                                    │
      └────────────────────────────────────┘
      D                                    C
```

Anna will plant a tree in the garden.

The tree must be

- closer to A than to D
- less than 9 m from C.

Construct and shade the region where Anna can plant the tree.
Leave in all your construction lines. **[4]**

19 Rick asked a random sample of 160 students from his school what they did for lunch.
The table shows the results of Rick's survey.

School lunch	Packed lunch	Go to shops	No lunch
43	61	38	18

(a) Work out the relative frequency of eating school lunch.

(a) _____ **[1]**

(b) There are 1200 students in the school.

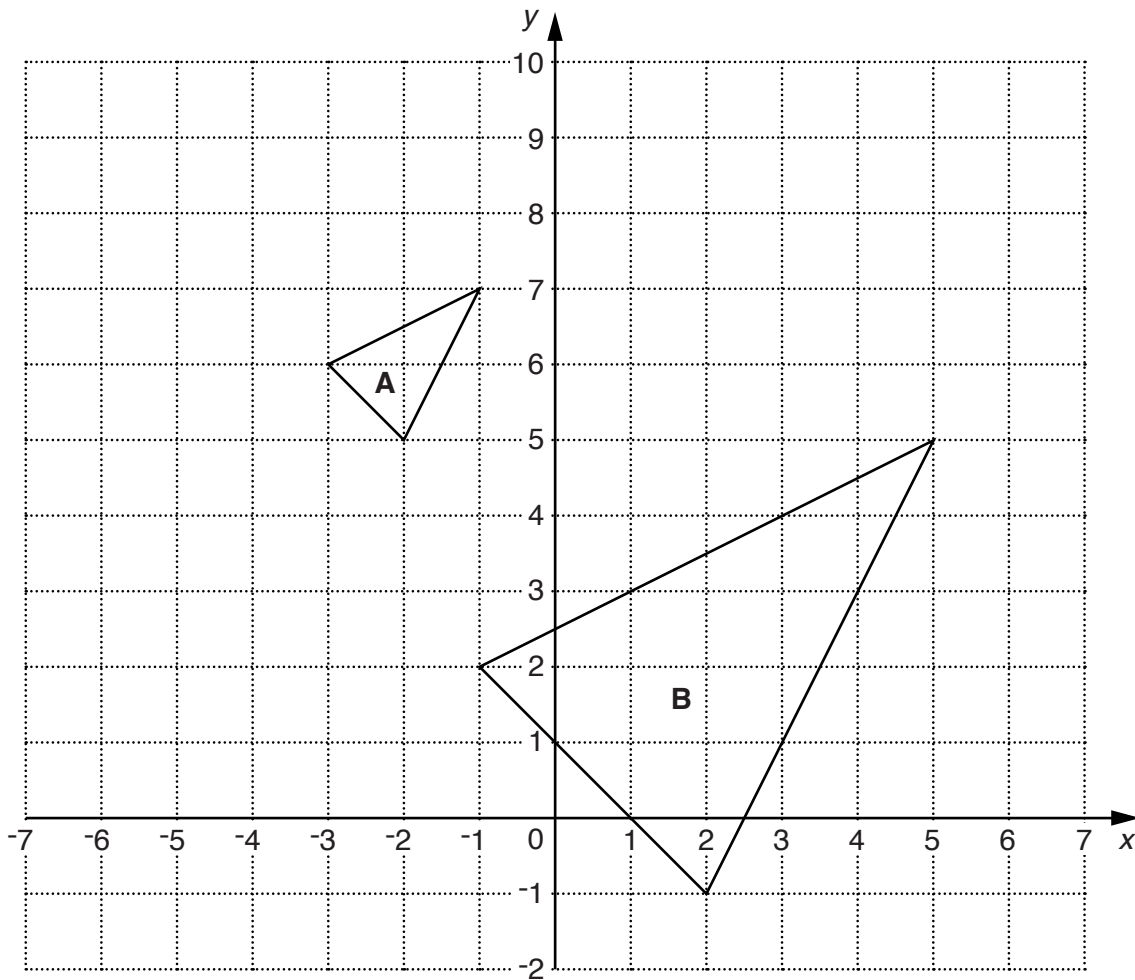Estimate the number of students in the school who go to the shops for their lunch.

(b) _____ **[2]**

20* Rearrange this formula to make *t* the subject.

$v = 5t + 20$

_____ **[2]**

21 Triangles **A** and **B** are drawn on the grid.

(a) Translate triangle **A** by $\begin{pmatrix} -3 \\ -1 \end{pmatrix}$.

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

(b) Describe fully the enlargement that maps triangle **A** onto triangle **B**.

_____ **[2]**

END OF QUESTION PAPER