

**Wednesday 4 November 2015 – Morning**

**GCSE MATHEMATICS A**

**A502/01** Unit B (Foundation Tier)

Candidates answer on the Question Paper.

**OCR supplied materials:**  
None

**Other materials required:**

- Geometrical instruments
- Tracing paper (optional)

**Duration:** 1 hour



Candidate forename		Candidate surname	
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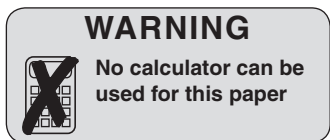
Centre number						Candidate number				
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**INSTRUCTIONS TO CANDIDATES**

- 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.

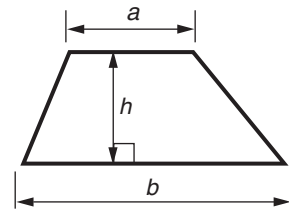
**INFORMATION FOR CANDIDATES**

- 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 **60**.
- This document consists of **16** pages. Any blank pages are indicated.

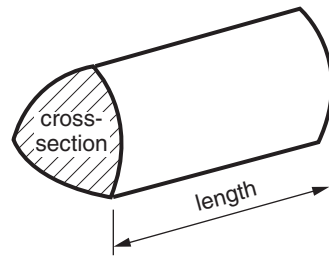


## Formulae Sheet: Foundation Tier

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



**Volume of prism** = (area of cross-section)  $\times$  length



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1 Here are some prices.

	Price for 1 kg
Apples	£2.40
Pears	£2.56
Bananas	90p

(a) Alan buys 2 kg of apples.  
How much does he pay?

(a) £ ..... [1]

(b) What is the price of  $\frac{1}{2}$  kg of pears?

(b) £ ..... [1]

(c) Jenny buys 1 kg of apples, 1 kg of pears and 1 kg of bananas.

How much change does she receive from £10?

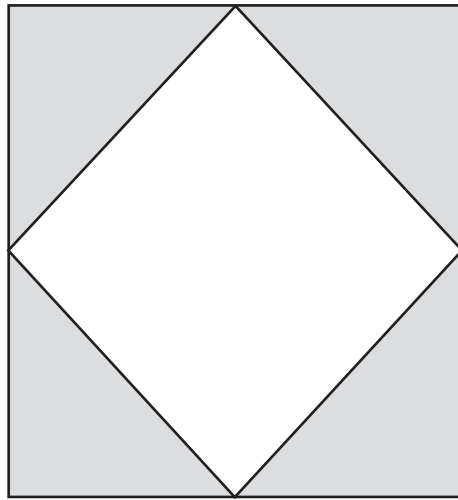
(c) £ ..... [3]

(d) Nadal buys 1 kg of apples, 2 kg of pears and a whole number of kilograms of bananas.  
Nadal pays with a £10 note and gets less than £1 in change.

How many kilograms of bananas does he buy?

(d) ..... kg [3]

- 2 The middle points of the sides of a square are joined with straight lines. The four triangles formed are shaded.



Not to scale

- (a) (i) Complete this statement.

The two different angle sizes in each triangle are .....° and .....°. [1]

- (ii) Choose from this list to describe each triangle.  
Circle your choice.

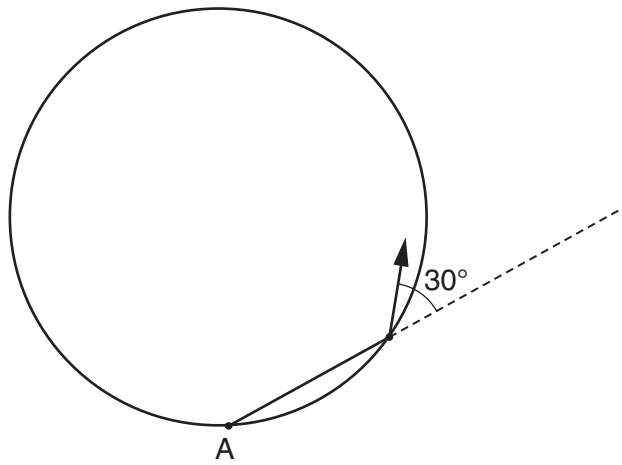
Scalene      Equilateral      Isosceles [1]

- (b)\* Without measuring, explain why the un-shaded shape is a square. [3]

- (c) What fraction of the large square is shaded?

(c) ..... [1]

- (d) A toy robot travels only in straight lines.  
 It starts at point A on a circle.  
 It turns  $30^\circ$  anticlockwise each time it meets the circle.  
 The robot's path forms a regular polygon.

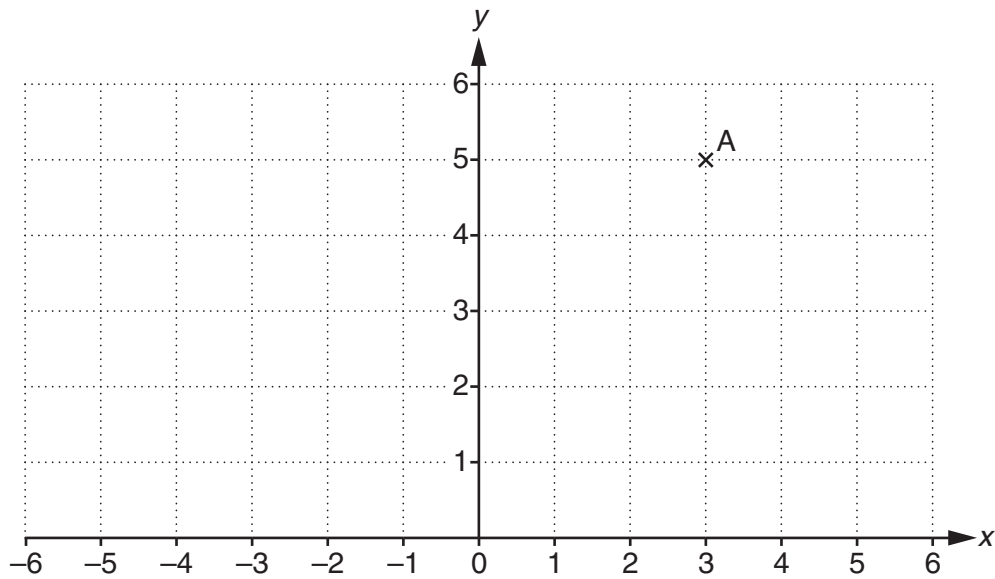


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At how many different points, including A, does the robot meet the circle?

(d) ..... [2]

- 3 Point A is plotted on this one-centimetre square grid.



- (a) Write down the coordinates of point A.

(a) (....., .....) [1]

- (b) Point B has coordinates  $(-3, h)$ .  
AB is 6 cm.

Write down the value of  $h$ .

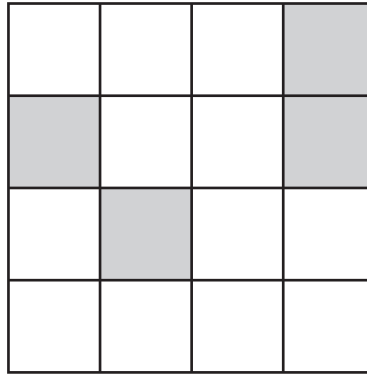
(b)  $h =$  ..... [1]

- (c) ABCD is a rectangle.  
The shorter sides are each 4 cm.

Write down the coordinates of C.

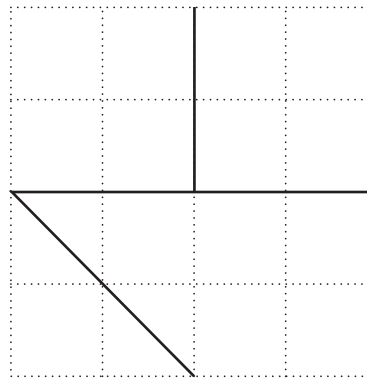
(c) (....., .....) [1]

- 4 (a) Shade **two more** small squares so the shape has only one line of symmetry.



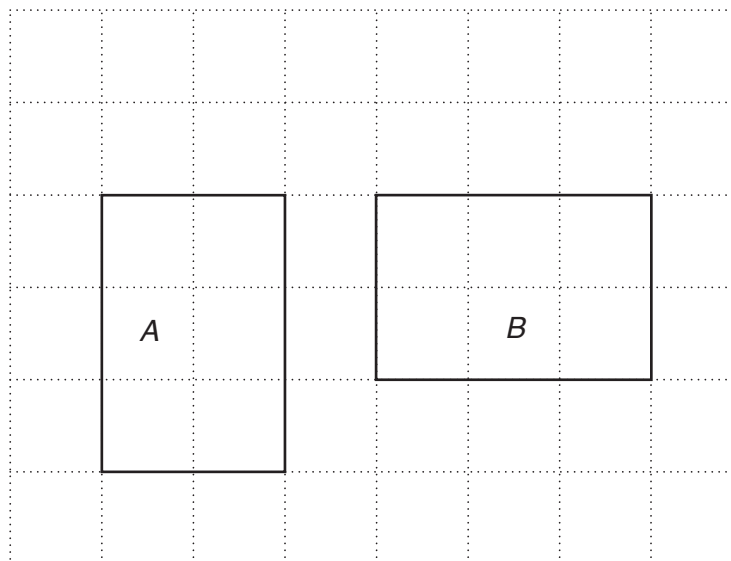
[2]

- (b) Part of a shape is drawn on the grid below.  
Draw **two more** lines so the shape has rotation symmetry of order 2.



[2]

- (c) Shape *A* is rotated to shape *B*.



Mark with a cross (*X*) the centre of rotation.

[1]

5 (a) Write down the value of 5 squared.

(a) ..... [1]

(b) What is the square root of 81?

(b) ..... [1]

(c) Write down the value of  $2^3$ .

(c) ..... [1]

(d) Write the following as a single power of 3.

$$\frac{3 \times 3 \times 3 \times 3}{3 \times 3}$$

(d) ..... [2]

6 (a) Each side of a square is of length  $g$  centimetres.



(i) Complete the statement by choosing from this list.

an equation      a formula      an expression

$4g$  is ..... for the distance in centimetres around the square. [1]

(ii) The distance around the square is 50 cm or less.

When  $g$  is a whole number, find the greatest possible length of one side of the square.

(a)(ii) ..... cm [2]

(b) Solve.

(i)  $x - 1 > 3$

(b)(i) ..... [1]

(ii)  $2y < 10$

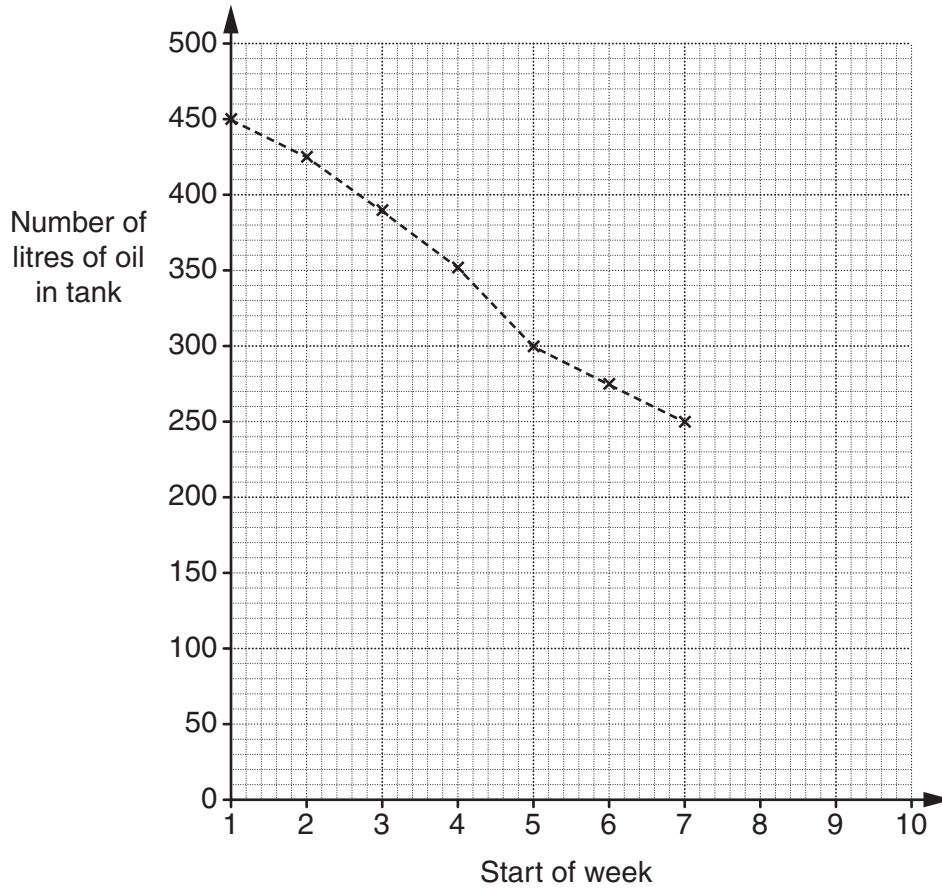
(ii) ..... [1]



- 7 Magda lives in the countryside. Her central heating system burns oil from a tank. She measures the amount of oil in the tank at the start of each week.

Start of week	1	2	3	4	5	6	7	8	9
Number of litres of oil in tank	450	425	390	351	300	275	250	225	200

Magda has marked the first 7 measurements on this graph.



- (a) Complete Magda's time series graph. [2]

- (b) When the weather is cold, more oil is burned.

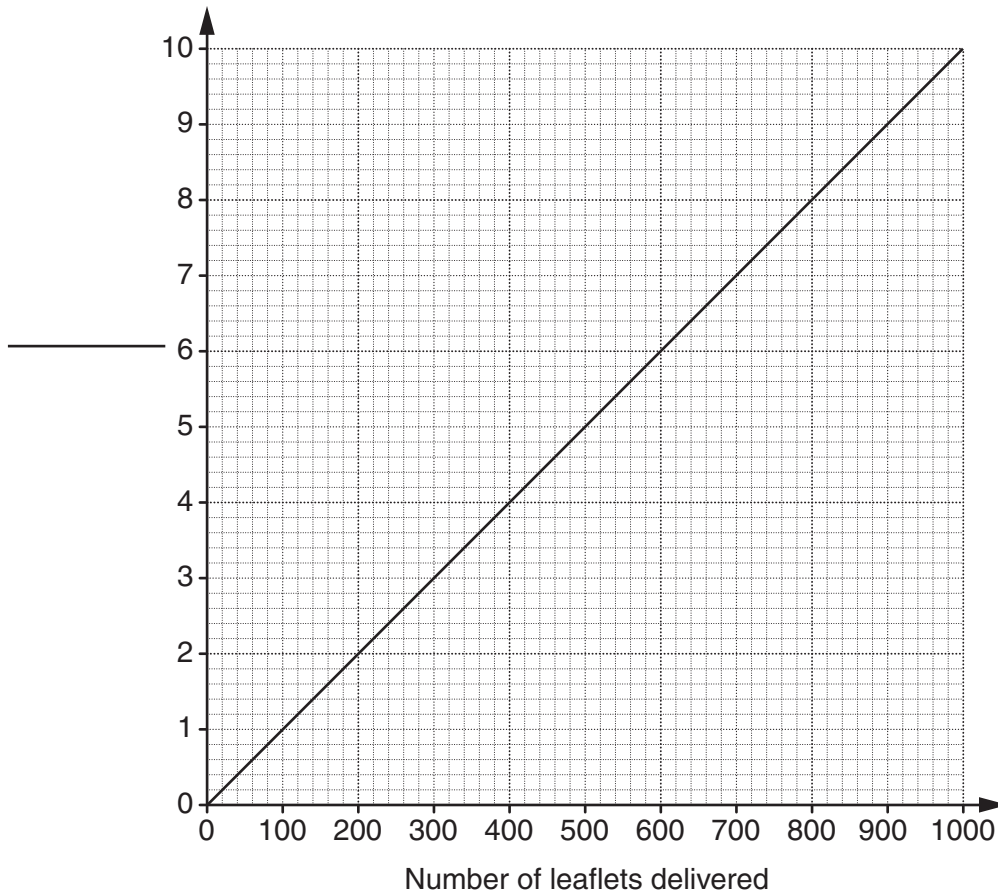
Which was the coldest week?

(b) ..... [1]

- (c) Use the graph to estimate the amount of oil in Magda's tank at the start of week 10.

(c) ..... litres [1]

- 8 Adam delivers leaflets.  
 He is paid 1p for every leaflet he delivers.  
 This graph shows how much he could be paid for delivering different numbers of leaflets.



(a) Label the vertical axis. [1]

(b) One week Adam earned £5.60.

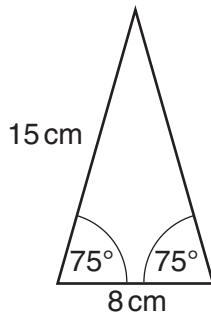
How many leaflets did he deliver?

(b) ..... [1]

(c) Work out the gradient of the line. Give your answer as a decimal.

(c) ..... [2]

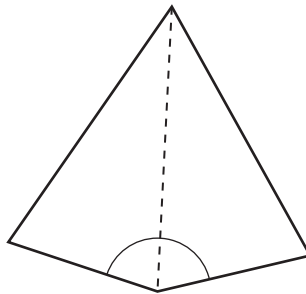
9 Here is a triangle.



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Two of these triangles are joined, longest side to longest side, to form a quadrilateral.

(a) This kite is one possible quadrilateral.



Write down the mathematical name for the type of angle marked on the diagram.

(a) ..... [1]

(b) It is possible to form another quadrilateral by joining two of these triangles, longest side to longest side.

(i) Sketch this quadrilateral. [1]

(ii)\* Giving your reasons, write the mathematical name of the new quadrilateral and work out the size of its largest angle. [4]

10 Mikey has £15.45 in his wallet.

(a) The money is made up of 2 notes and 8 coins, none of which are 10p coins. [2]

Show how this could be done.

(b) Mikey buys a pad of paper for £2.49 and a pack of pens for £1.99.

(i) How much money will he have left?

(b)(i) £ ..... [3]

(ii) Use **estimation** to check your answer to part (b)(i). [2]  
Make your method of checking clear.

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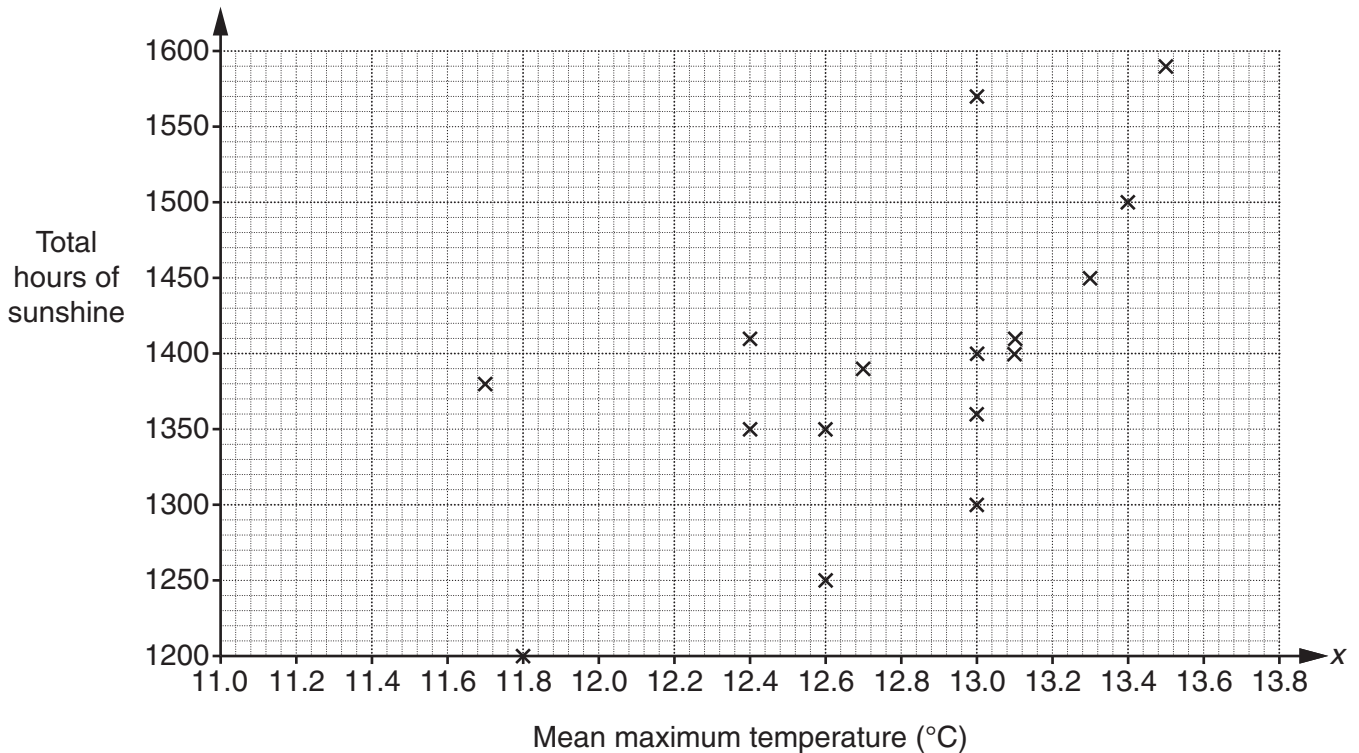
QUESTION 11 IS PRINTED OVERLEAF

- 11 This table shows the mean maximum temperature and the total hours of sunshine recorded at one UK weather centre each year from 1993 to 2013.

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Mean maximum temperature (°C)	11.8	12.4	13.0	11.7	13.1	12.6	13.0	12.6	12.4	13.0	13.5
Total hours of sunshine	1200	1350	1570	1380	1410	1250	1400	1350	1410	1300	1590

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Mean maximum temperature (°C)	13.0	13.1	13.4	13.3	12.7	12.8	11.7	13.3	12.4	12.4
Total hours of sunshine	1360	1400	1500	1450	1390	1470	1460	1410	1340	1420

The results for the first 16 years are plotted on the scatter diagram.



(a) Complete the scatter diagram. [2]

(b) Describe the strength and type of correlation between mean maximum temperature and total hours of sunshine.

.....  
.....  
..... [2]

(c) Is it appropriate to draw a line of best fit on your scatter diagram? Explain your answer.

.....  
.....  
.....  
..... [1]

**END OF QUESTION PAPER**

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