OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS A

Unit B (Foundation)

A502/01

Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:
- Geometrical instruments
- Tracing paper (optional)

SPECIMEN

Duration: 1 hour

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that 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.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

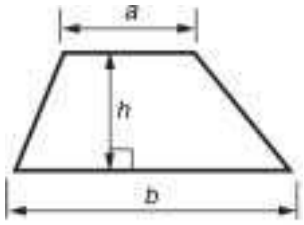
INFORMATION FOR CANDIDATES

- 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.

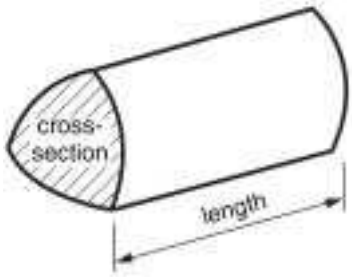
WARNING
You are NOT permitted to use a calculator for this paper.

Formulae Sheet: Foundation Tier

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



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



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1 Amir is playing with some shapes.

(a) One shape has four sides.
All its sides are the same length.
It has no right angles.

(i) Sketch this shape. **[1]**

(ii) Write down the name of this shape.

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

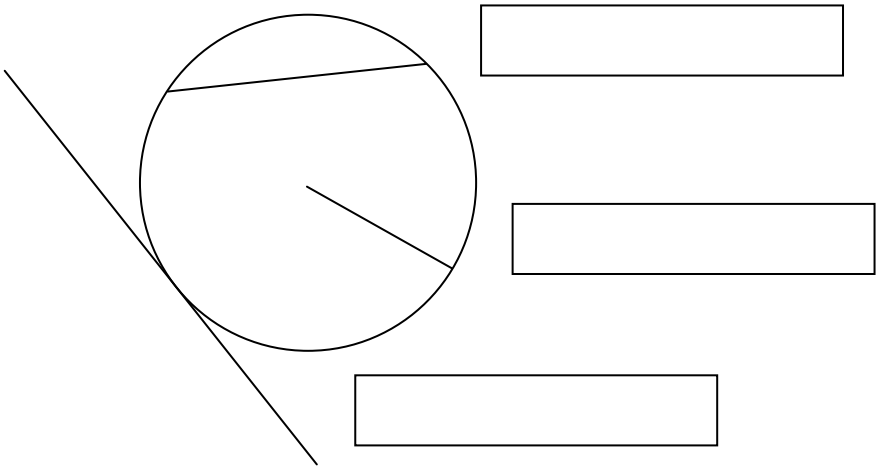
(b) Another shape has four sides.
All its sides are different lengths.
It has one pair of parallel sides.

(i) Sketch this shape. **[1]**

(ii) Write down the name of this shape.

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

2 Label each of the straight lines drawn on this circle.



[3]

3 Here are the ages of two parents and their five children.

47 49 28 27 22 21 17

(a) From this list choose

(i) a square number,

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

(ii) a cube number.

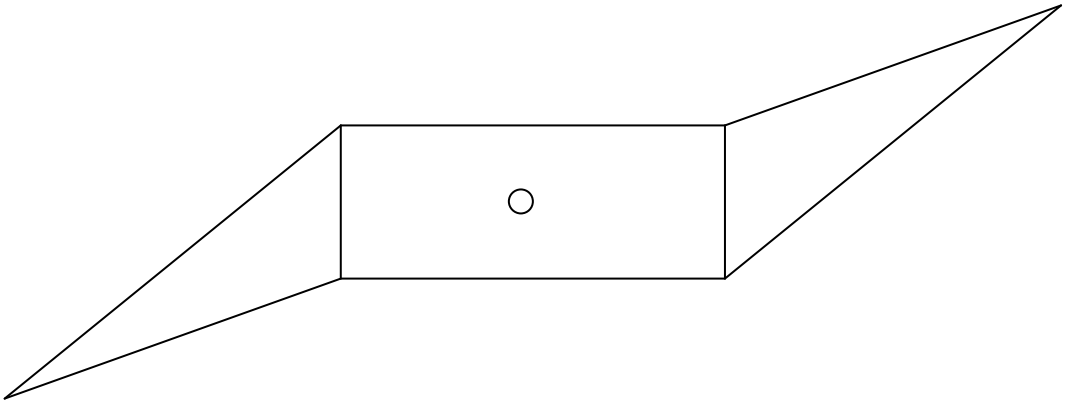
(ii) _____ **[1]**

(b) The family has a dog that is 4 years old.
Each 1 year of a dog's life is equivalent to 7 years of a human's life.

Which number in the list is equivalent to the dog's age?

(b) _____ **[1]**

4 This is the shape of a lawnmower blade.



Complete the following.

(a) The lawnmower blade has _____ line(s) of symmetry. **[1]**

(b) The lawnmower blade has rotation symmetry order _____. **[1]**

5 **(a)** Write down a decimal that has a value between 0·0854 and 0·129.

(a) _____ **[1]**

(b) Write down a fraction that has a value between $\frac{1}{2}$ and $\frac{3}{4}$.

(b) _____ **[1]**

(c) Write in order of size, starting with the smallest.

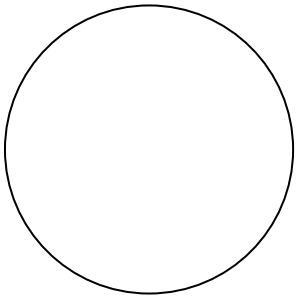
$\frac{1}{20}$ 0.02 20%

_____ _____ _____ **[2]**

smallest

6 The angle between the hands on a clock is 150°.
The minute hand is pointing at 12.

What time(s) could the clock be showing?



_____ **[2]**

7 Work out.

(a) 25% of 84

(a) _____ **[2]**

(b) $\frac{2}{5}$ of 40

(b) _____ **[2]**

8 Jenny is laying a new patio in her garden.
She has found two types of patio tile that she likes.
One of the types of tile is a regular octagon and the other is a square.

(a) The interior angle of a regular octagon is 135°.

Explain why it is **not** possible to tile the patio using only regular octagonal tiles.

_____

_____ **[2]**

It **is** possible to tile the patio using both the octagonal and square tiles.
The sides of the octagonal tiles are 360 mm.

(b) (i) Choose from this list a suitable length for the sides of the square tiles.

50 mm 100 mm 180 mm 300 mm

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

(ii) Give a reason why the other lengths are not suitable.

_____

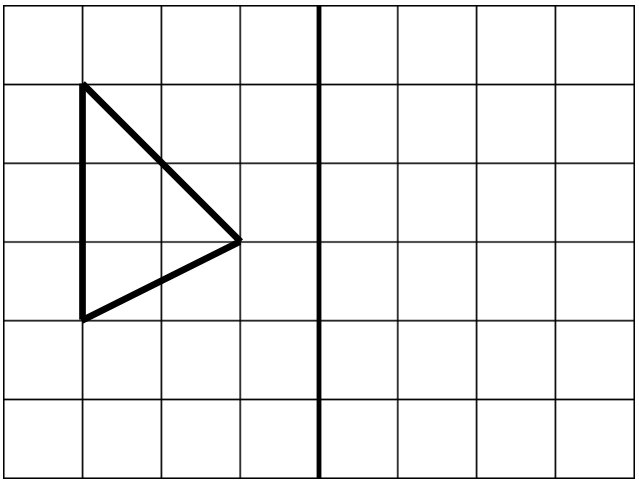
_____ **[1]**

(c) An octagonal tile with sides of 360 mm is an enlargement of an octagonal tile with sides of 60 mm.

Write down the scale factor of the enlargement.

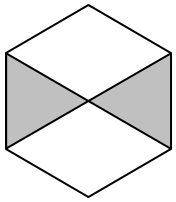
(c) _____ **[1]**

9 Draw the reflection of the triangle in the line shown.



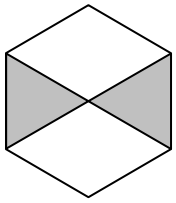
[2]

10 This pattern is made by shading part of a regular hexagon.



(a) Draw all the lines of symmetry of the pattern. **[2]**

(b) What fraction of the hexagon is **shaded**?
You may use the diagram below to help you decide.



(b) _____ **[2]**

(c) Explain why the two **shaded** triangles are congruent.

_____ **[1]**

11 Work out.

(a) 10^3

(a) _____ **[1]**

(b) $7 + \sqrt{25}$

(b) _____ **[1]**

(c) $3^2 \div 2^3$

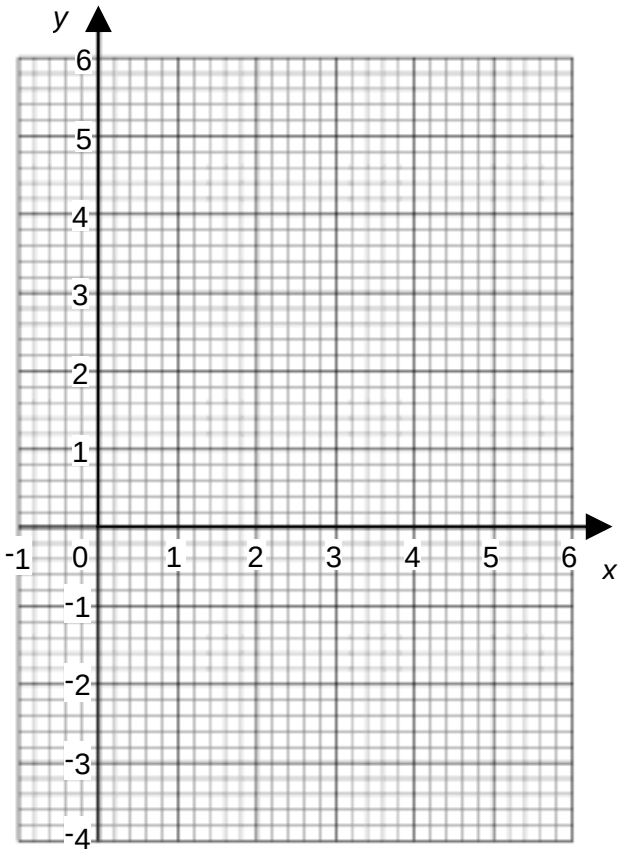
(c) _____ **[2]**

12 **(a)** Complete the table of values for $y = 2x - 3$.

x	0	1	2	3
y	-3	-1		3

[1]

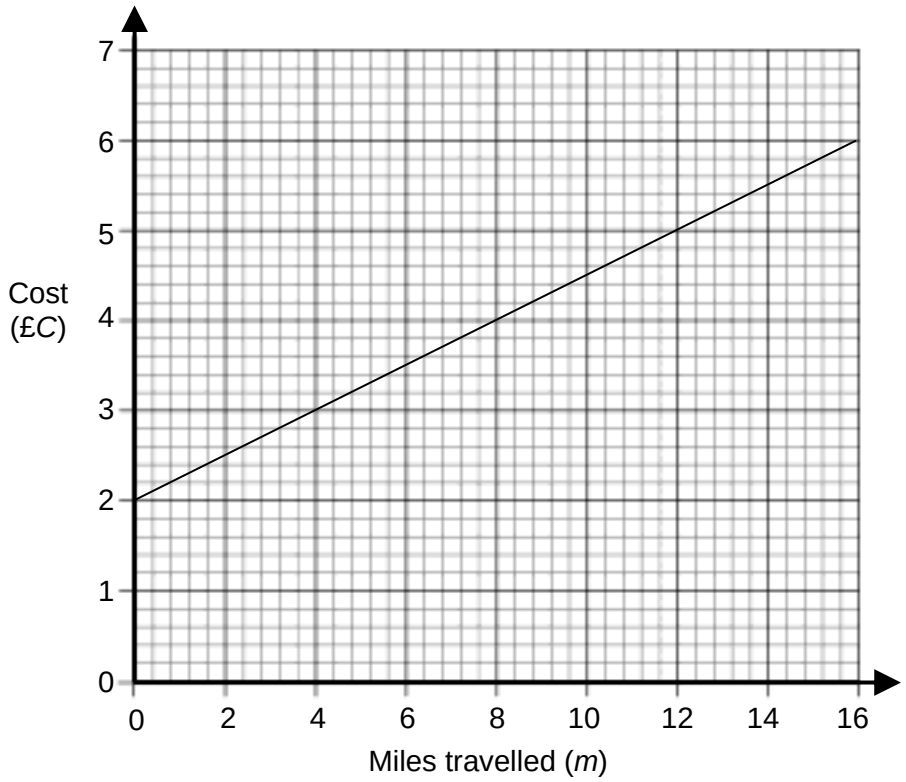
(b) On the grid draw the line $y = 2x - 3$.



[2]

(c) On the same grid draw the line $x = 2$. **[1]**

13 The graph shows the costs charged by Jim's taxi hire.



(a) Find the cost of taxi hire to travel 12 miles.

(a) £ _____ **[1]**

(b) It costs £3·50 to hire the taxi to travel 6 miles.

Explain why the cost to travel 6 miles is more than half of the cost to travel 12 miles.

_____

_____ **[1]**

(c) Write a formula for the cost (£*C*) of hiring the taxi to travel *m* miles.

(c) _____ **[2]**

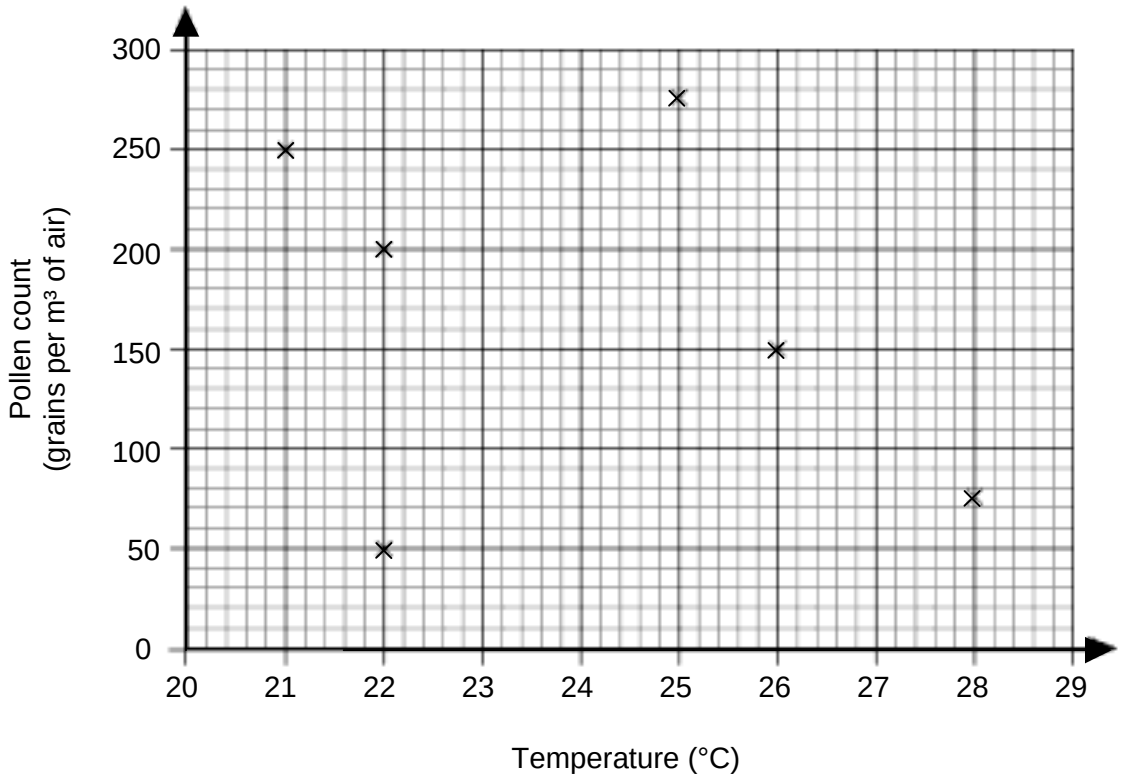
14* The higher the level of pollen in the air the more hay fever sufferers will be affected.

The table shows the temperature, humidity and pollen count in the air on six days in May.

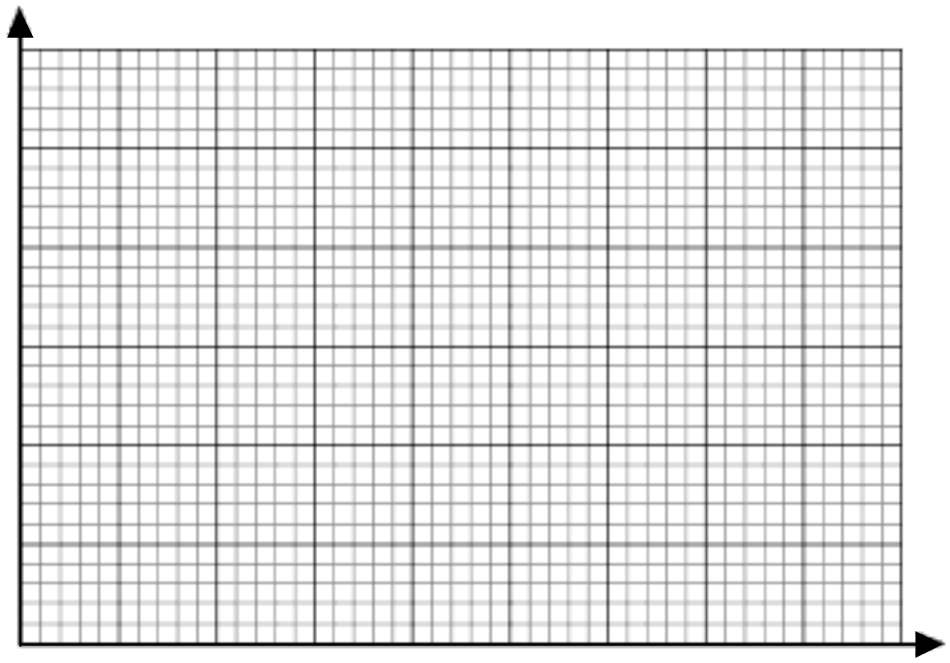
Temperature (°C)	Humidity (%)	Pollen count (grains per m^3 of air)
28	60	75
26	54	151
22	45	199
22	68	50
21	37	248
25	32	275

Carmela thinks that pollen count is affected by temperature and by humidity.

Carmela draws this scatter graph to show pollen count against temperature.



On the grid below, draw another scatter graph for Carmela.
Use the two graphs to decide if Carmela is right.



[6]

15 Four teams competed in a competition to design a strong bridge that was as light as possible. The efficiency of each bridge was worked out using this formula.

$$\text{Efficiency} = \text{maximum load the bridge could support} \div \text{weight of the bridge}$$

The table shows the results.

Team	Maximum load (kg)	Weight (kg)	Efficiency
1	14·5	0·70	
2	11·6	0·48	
3	16·4	1·12	
4	16·7	0·89	

Use estimation to identify the most efficient team and the least efficient team.

Most efficient _____

Least efficient _____ **[5]**

16 **(a)** Solve.

$4x - 7 < 15$

(a) _____ **[2]**

(b) Represent your solution on the number line.

[1]

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