

Thursday 19 January 2012 – Afternoon

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.

WARNING

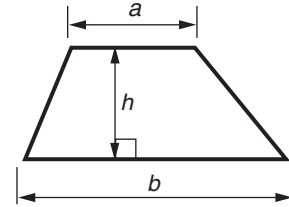


No calculator can be used for this paper

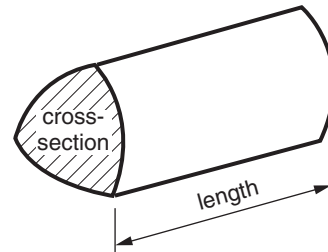
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Formulae Sheet: Foundation Tier

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



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



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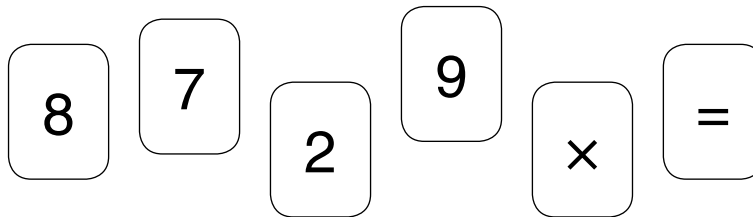
OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

1 (a) Complete this table.

Fraction	Percentage
$\frac{3}{4}$	=
	= 10%

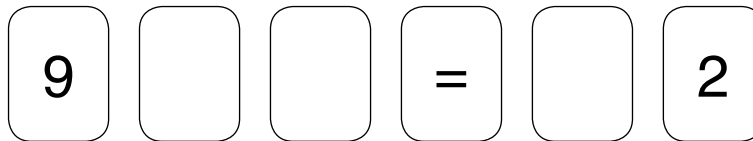
[2]

(b) (i) Jenny has these six cards.



Jenny arranges **all** of the cards to make a correct calculation.

Complete the three cards to show this calculation.

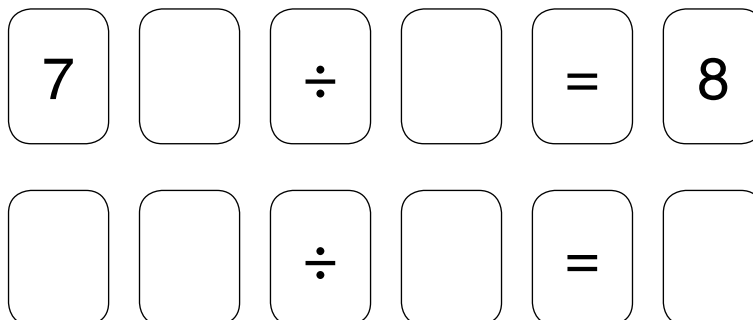


[1]

(ii) Jenny swaps \times for \div but keeps all the other cards.

She makes two **different**, correct calculations using the six cards.

Complete the cards to show these calculations.



[2]

- 2 (a) Tom buys a rose bush costing £3.40 and a garden fork costing £12.75.
He pays with a £20 note.

How much change should he receive?

(a) £ _____ [3]

- (b) (i) Gita sees these plants for sale.
Gita buys 4 of these plants.

How much cheaper is it for Gita to buy 4 plants
at the Offer Price than separately?

£2.80 each or
Offer Price
4 for £10

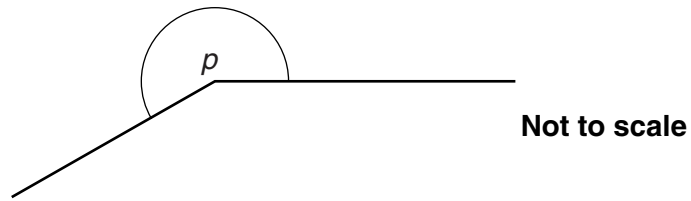


(b)(i) £ _____ [2]

- (ii) These plants produce either red or white flowers.
Out of 80 plants, 7 produce white flowers.

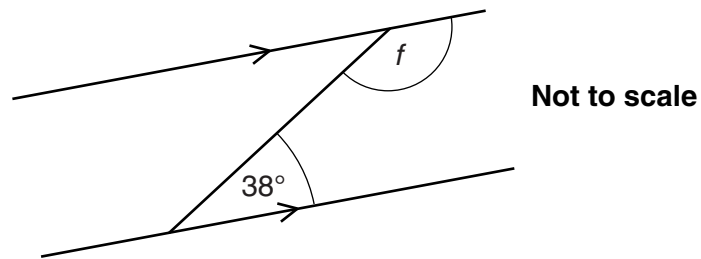
Is this more or less than 10% of the plants?
Show how you decide.

- 3 (a) What type of angle is angle p ?



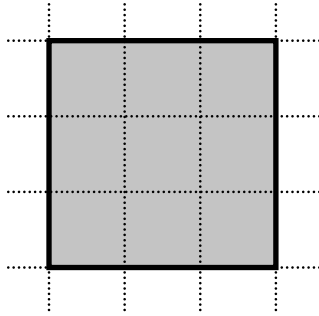
(a) _____ [1]

- (b) Work out the size of angle f .



(b) _____ $^\circ$ [2]

- 4 (a) A square of side 3cm is drawn on a one-centimetre grid.



How many one-centimetre squares does it contain?

(a) _____ [1]

- (b) A square of side 8cm is drawn on a one-centimetre grid.

How many one-centimetre squares does it contain?

(b) _____ [1]

- (c) A square is drawn on a one-centimetre grid and contains 225 of the one-centimetre squares.

How long is one of its sides?

(c) _____ cm [1]

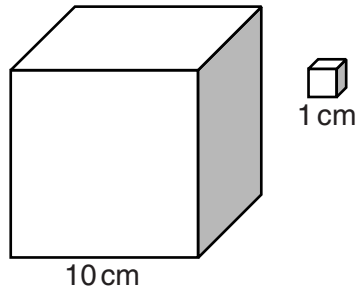
- (d) A square of side h cm is drawn on a one-centimetre grid.

Complete this statement.

(d) This square contains _____ one-centimetre squares. [1]

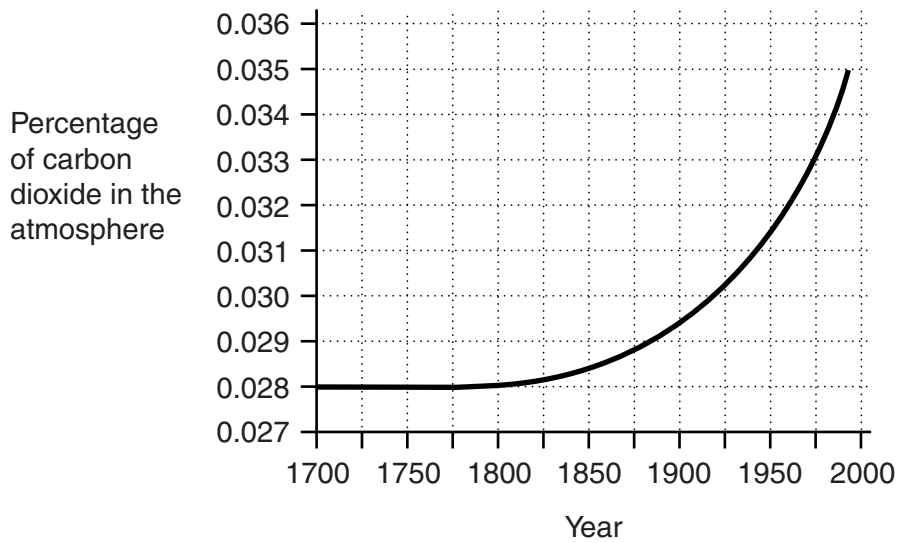
- (e) A large cube is made using one-centimetre cubes.
Each edge of the large cube is 10 cm long.

How many one-centimetre cubes are used to make the large cube?



(e) _____ [1]

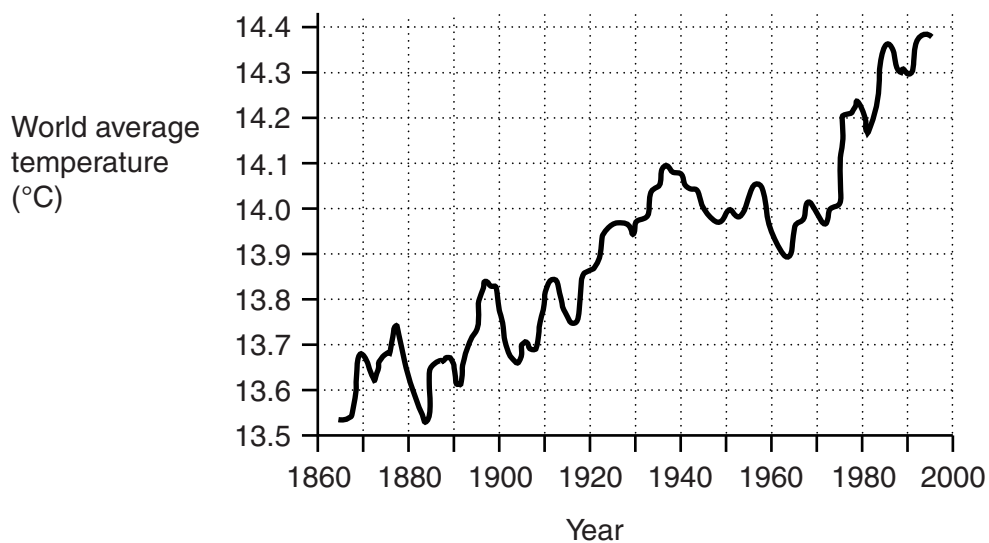
- 5 (a) This graph shows the percentage of carbon dioxide in the atmosphere from 1700 to 1995.



In approximately which year was the percentage of carbon dioxide in the atmosphere 0.031?

(a) _____ [1]

- (b) This graph shows the world average temperatures from 1865 to 1995.



Describe how world average temperatures have changed from 1865 to 1995. Use figures from the graph in your answer.

6 Here are some situations and some formulas.

	Situation
1	The distance all around any regular polygon is the same as the number of sides multiplied by the length of one side.
2	Alma and Tessa shared a bag of sweets equally and there was one sweet left. How many sweets altogether were in the bag?

	Formula
a	$t = 2h + 1$
b	$p = 5g$
c	$p = fg$
d	$t = \frac{m}{2} + 1$

(a) Match each situation to a formula representing it.
Write the letter for the correct formula next to the number of the situation in the answer space.

(a) Situation **1**: Formula _____

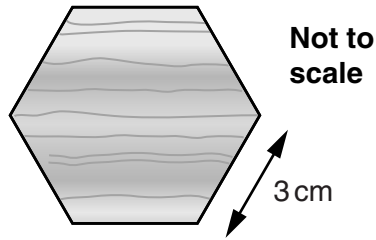
Situation **2**: Formula _____ [2]

(b) For Situation **2** in part (a), explain clearly what each letter represents in the formula you have chosen.

[2]

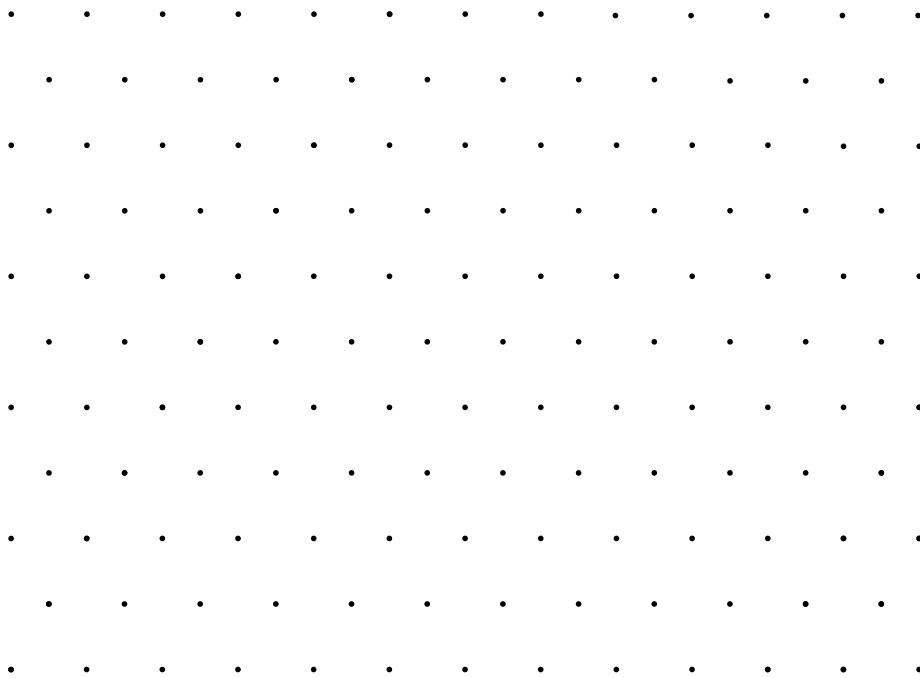
7 Alan makes drinks mats.

(a) He cuts out a wooden base that is a regular hexagon of side 3 cm.



Alan covers the top of the base with a pattern of tiles.
The tiles are equilateral triangles of side 3 cm.

(i) On the triangular spotty paper, show accurately the pattern of tiles that covers the base.



[2]

(ii) Alan uses black triangular tiles and white triangular tiles.

Shade your drawing in part (i) so that it has **exactly** 2 lines of symmetry.

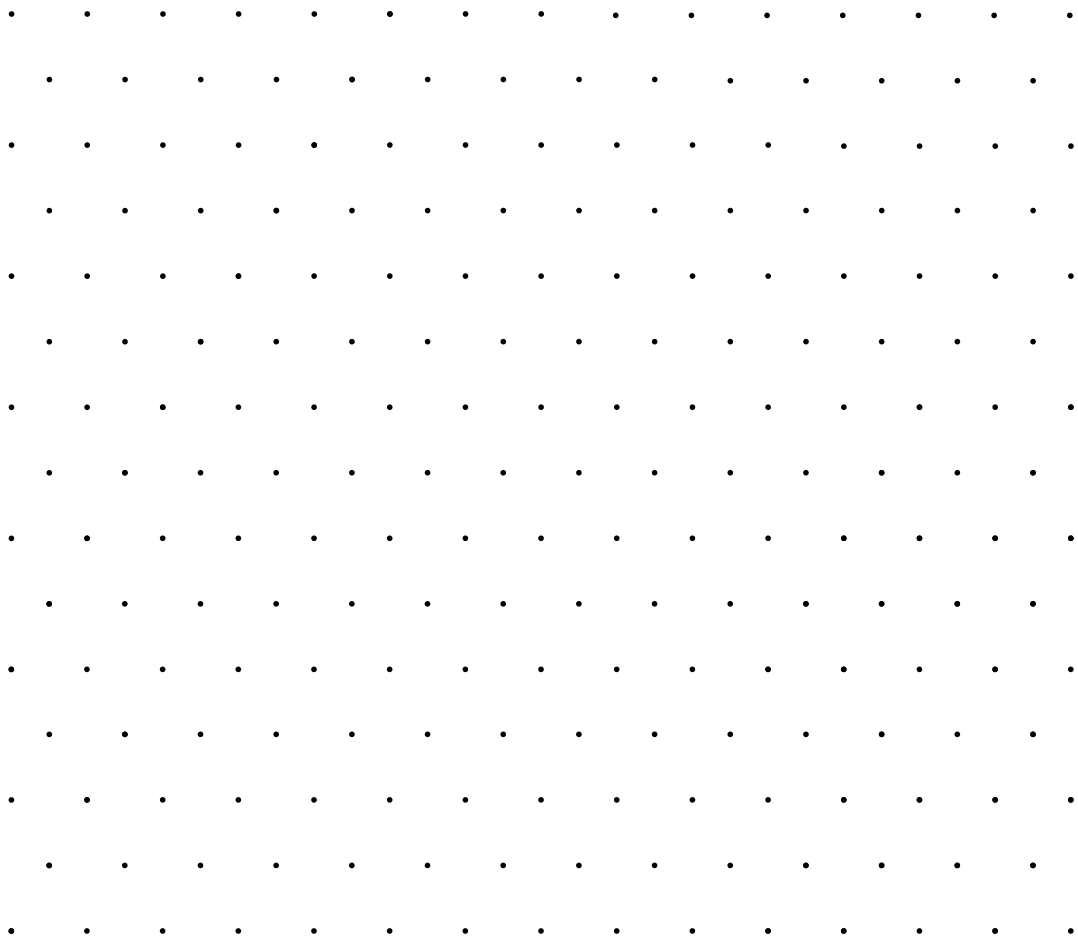
[2]

(iii) Using your drawing, work out the sum of the interior angles of a regular hexagon.

(a)(iii) _____ ° [2]

(b) Alan designs a new drinks mat.
He uses eight of the equilateral triangular tiles to make a quadrilateral.

(i) On the triangular spotty paper below, draw a quadrilateral that he could make.

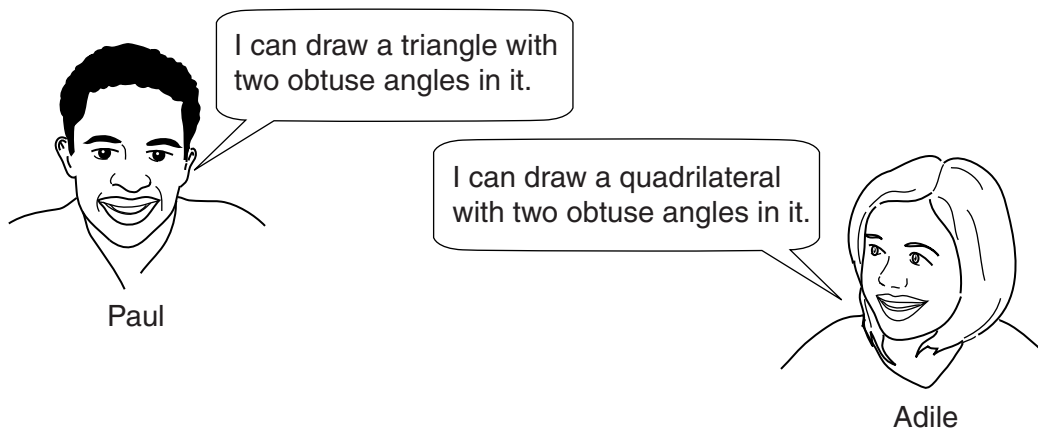


[2]

(ii) Give the mathematical name of your quadrilateral.

(b)(ii) _____ [1]

8* Paul and Adile talk about their homework.



Is Paul correct?

Is Adile correct?

Explain your reasons.

[5]

- 9 (a) When $\frac{1}{9}$ is changed to a decimal it is recurring, like this:

0.11111111

Show how you would indicate that the decimal is recurring.

(a) _____ [1]

- (b) Using division, change $\frac{5}{6}$ to a decimal.

(b) _____ [3]

- (c) When $\frac{1}{9}$ and $\frac{1}{3}$ are changed to decimals, both are recurring.

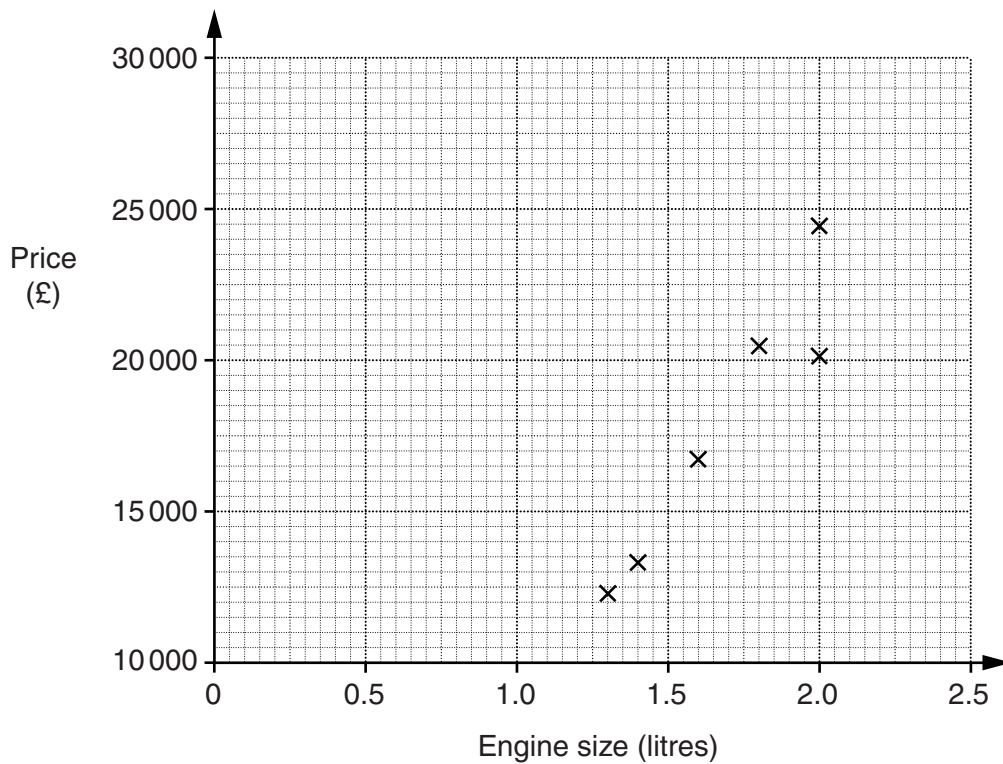
Write down a fraction between $\frac{1}{9}$ and $\frac{1}{3}$ that is **not** recurring.

(c) _____ [1]

10 A website gives the price and engine size for different models of one manufacturer's cars.

Engine size (litres)	Price (£)
1.3	12 360
1.4	13 345
1.6	16 695
1.8	20 495
2	20 095
2	24 295
2	29 945
2.2	27 345
2.5	25 745

(a) Complete the scatter graph below.
The first six points have been plotted for you.



[2]

(b) Draw a line of best fit on your scatter graph.

[1]

(c) Describe the correlation between price and engine size.

(c) _____ [1]

(d) This manufacturer is planning to produce a car with a 1.7 litre engine.

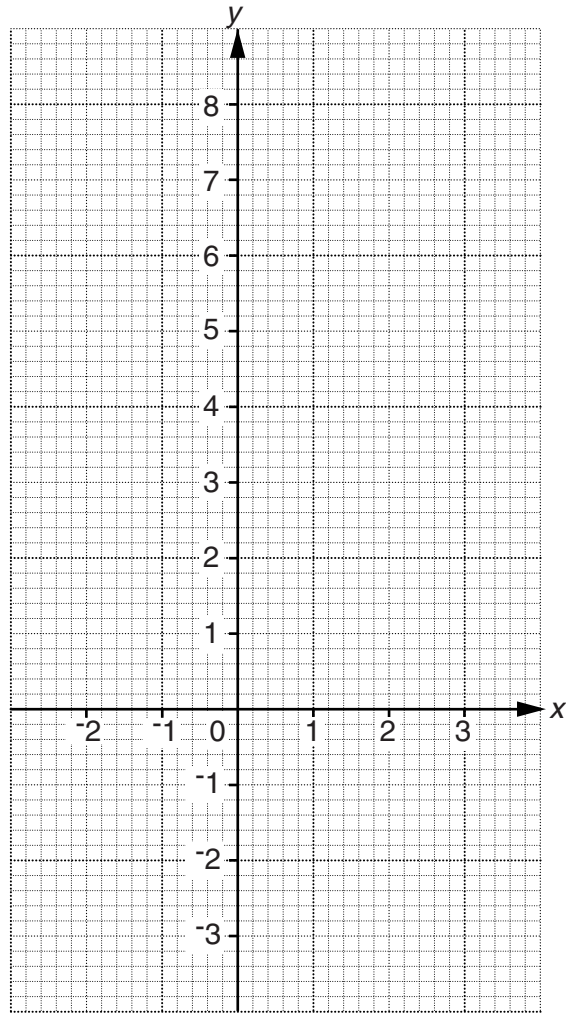
What might you expect its price to be?

(d) £ _____ [1]

(e) One of the cars is a sports model that is more expensive than other cars with the same engine size.

Put a ring round the point that represents the sports model. [1]

- 11 (a) On the grid, draw the graph of $y = 4 - 2x$ for x from -2 to 3 .



[3]

- (b) On the same grid, draw the graph of $y = 3$ and use it to solve these simultaneous equations.

$$y = 4 - 2x$$

$$y = 3$$

(b) $x =$ _____

$y =$ _____ [3]