OCR
RECOGNISING ACHIEVEMENT

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Tuesday 22 January 2013 – Afternoon

GCSE METHODS IN MATHEMATICS

B392/01 Methods in Mathematics 2 (Foundation Tier)

B3169501133

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
- Scientific or graphical calculator
- Geometrical instruments
- Tracing paper (optional)

Duration: 1 hour 30 minutes

B3920 1

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

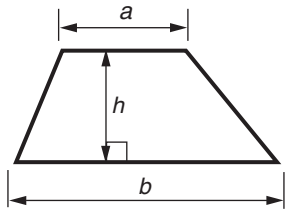
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is **90**.
- This document consists of **20** pages. Any blank pages are indicated.

You are permitted to use a calculator for this paper

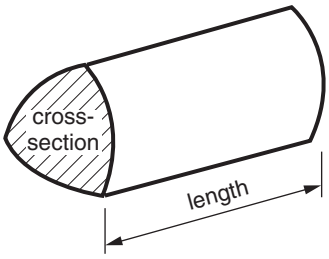
This paper has been pre modified for carrier language

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 These are the prices of fruit in a shop.

Melons £1.25 each	Bananas £1.20 per kg	Oranges 5 for 75p	Apples £1.60 per kg

Anne buys 2 melons, 1.5 kg of bananas, 10 oranges and 0.5 kg of apples.

Work out the cost of the fruit Anne buys.

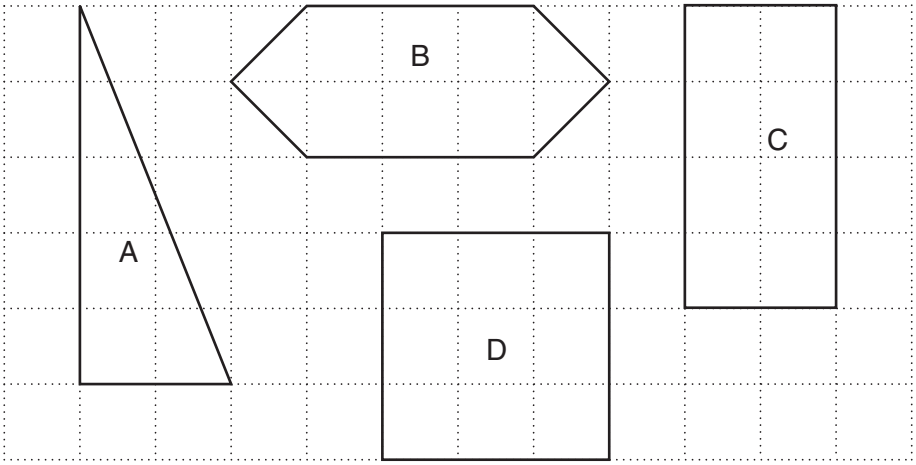
£ _____ **[4]**

2 Fill in the missing numbers in these sequences.

A	3, 7, 11, _____, _____, 23
B	27, 24, 21, _____, _____, 12
C	1, 3, 9, _____, _____, 243

[6]

3 These are four shapes drawn on a centimetre square grid.



(a) Which two shapes have the same area?

(a) _____ and _____ **[2]**

(b) Which shape has the longest perimeter?

(b) _____ **[2]**

4 Chris and Wendy go to a garden centre.

(a) Chris wants to buy some rose plants. He has £20 to spend.
One rose plant costs £3.49.

What is the greatest number of rose plants that Chris can buy?

(a) _____ **[2]**

(b)* Wendy wants to buy some marigold plants.
The plants are sold in trays of 4 plants and trays of 6 plants.
A tray of 4 plants costs £1.80.
A tray of 6 plants costs £2.40.
Wendy has £9 to spend.

What is the greatest number of marigold plants that Wendy can buy?

(b) _____ **[4]**

5 **(a)** Calculate.

(i) 1.5^3

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

(ii) $\sqrt{5.76}$

(ii) _____ **[1]**

(b) Calculate.

$$\frac{81.3 + 79.2}{8.4}$$

Write your answer correct to 2 decimal places.

(b) _____ **[2]**

6 As you climb a mountain the temperature falls.
This formula tells you how much the temperature falls.

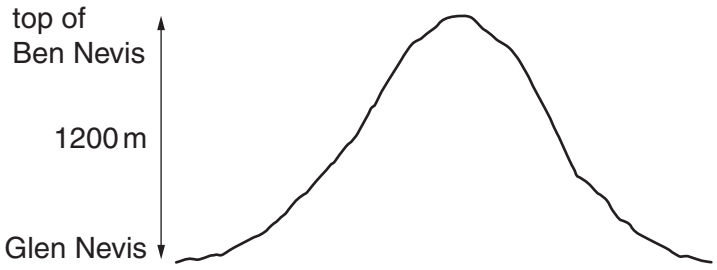
$$\text{fall in temperature in °C} = \frac{\text{height climbed in metres}}{200}$$

(a) Mario climbs 800 m.

What is the fall in temperature?

(a) _____ °C **[1]**

(b) The top of Ben Nevis is 1200 m above Glen Nevis.



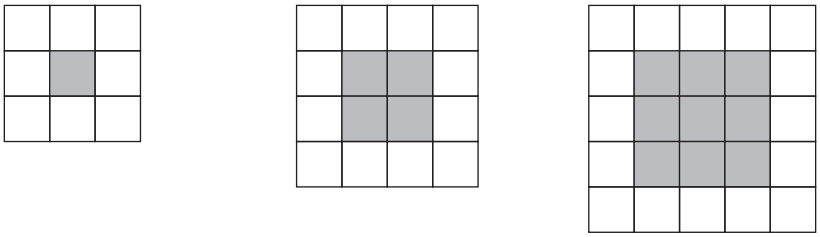
One morning, the temperature in Glen Nevis is 19°C.

What would you expect the temperature to be at the top of Ben Nevis?

(b) _____ °C **[2]**

7 This is a sequence of tile patterns.

Pattern 1 Pattern 2 Pattern 3



(a) Complete this table for patterns 1, 2, 3 and 4 in the sequence.

Pattern Number	1	2	3	4
Number of Shaded Tiles	1	4		
Number of Unshaded Tiles	8	12		

[2]

(b) Work out the number of shaded tiles and the number of unshaded tiles in the 10th pattern.

(b) number of shaded tiles _____ **[2]**

number of unshaded tiles _____ **[2]**

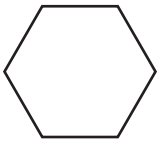
8 **(a)** Work out 20% of £640.

(a) £ _____ **[2]**

(b) Last year a speedway team won 15 races out of 30.
What percentage of the races did the team win?

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

9 **(a)** This is a regular hexagon.



Draw a tessellation of these regular hexagons on the grid below.
You must draw at least 8 hexagons. **[2]**

(b) Explain how you can use the tessellation to work out the interior angle of a regular hexagon.

_____

_____

_____

_____ **[2]**

10 **(a)** This is an inequality.

$22n + 12 < 100$

Is each of these values of n a solution of this inequality?
Write 'yes' or 'no' under each value.

$n = 3$	$n = 3.5$	$n = 4$	$n = 4.5$	$n = 5$
_____	_____	_____	_____	_____

[2]

(b) Solve.

$8x - 5 = 21$

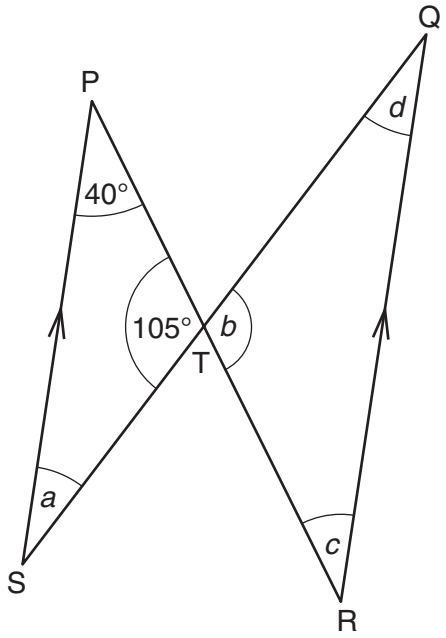
(b) _____ **[2]**

(c) Rearrange this formula to make x the subject.

$y = 5x + 2$

(c) _____ **[2]**

11 **(a)** PR and QS are straight lines. They intersect at T.
PS and QR are parallel lines.
Angle SPT = 40° and angle PTS = 105°.



Not to scale

Find the size of angle *a*, angle *b*, angle *c* and angle *d*.

(a) *a* = _____ °

b = _____ °

c = _____ °

d = _____ °

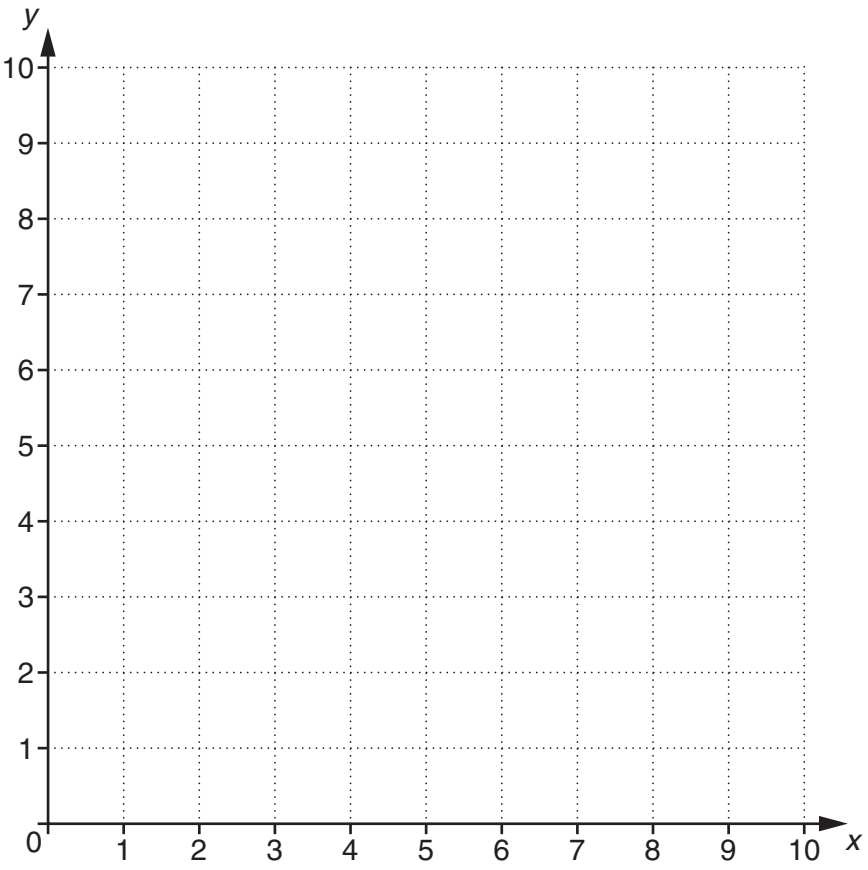
[4]

(b) The exterior angle of a regular polygon is 30°.

How many sides does the polygon have?

(b) _____ **[2]**

12 ABCD is a parallelogram.
A is at (1, 3), B is at (2, 6) and C is at (8, 7).



Find the coordinates of the **centre** of the parallelogram.

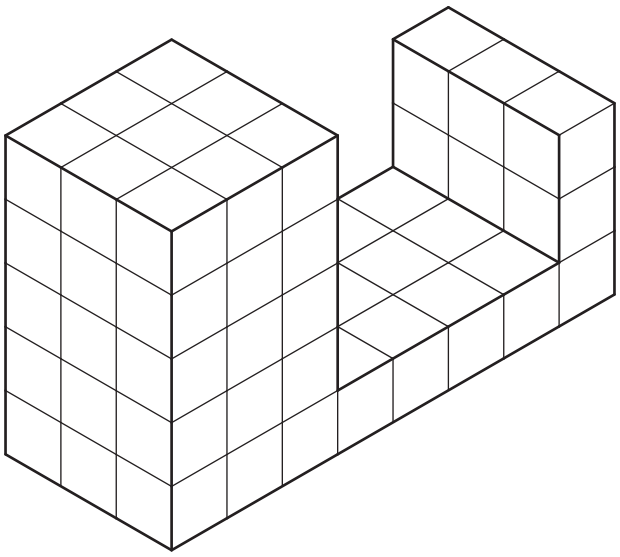
(_____ , _____) **[5]**

13* Is each of these statements about calculations with negative numbers true or false? Write true or false and give an example to justify each decision.

Statement	True or False	Example
When you add 3 negative numbers together the answer is negative.		
When you multiply 3 negative numbers together the answer is positive.		

[4]

14 This prism is made from one centimetre cubes.



What is the volume of the prism?

_____ cm^3 **[3]**

15 **(a)** Fill in the table below so that each row contains equivalent percentages, decimals and fractions. The fractions are in their simplest form.

The first row is done for you.

Percentage	Decimal	Fraction (in simplest form)
20%	0.2	$\frac{1}{5}$
		$\frac{3}{4}$
18%		
	$0.\dot{3}$	

[4]

(b) The ratio of boys to girls in one class at a school is 2 : 3.

What fraction of the class are boys?

(b) _____ **[1]**

16 Sadia knows that walking for an hour burns 200 calories.
A cake has 120 calories.

For how many minutes must Sadia walk to burn 120 calories?

_____minutes **[3]**

17 **(a)** Work out the following. Give your answer as a fraction in its simplest form.

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

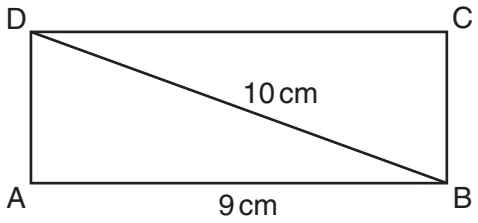
(a) _____ **[2]**

(b) Two fractions are multiplied together.
Each fraction is smaller than 1.
The answer is $\frac{4}{11}$ when simplified.

What could the two fractions be?

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

18 (a) Rectangle ABCD has a diagonal 10 cm long.
Side AB is 9 cm long.



Not to scale

Use Pythagoras' theorem to show that AD is 4.36 cm, correct to two decimal places.

_____

_____

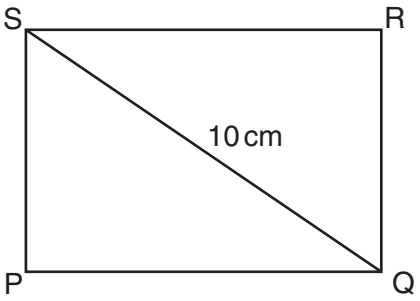
_____

_____

_____

_____ **[3]**

(b) A different rectangle, PQRS, also has a diagonal 10 cm long.
The area of rectangle PQRS is bigger than the area of rectangle ABCD.



Not to scale

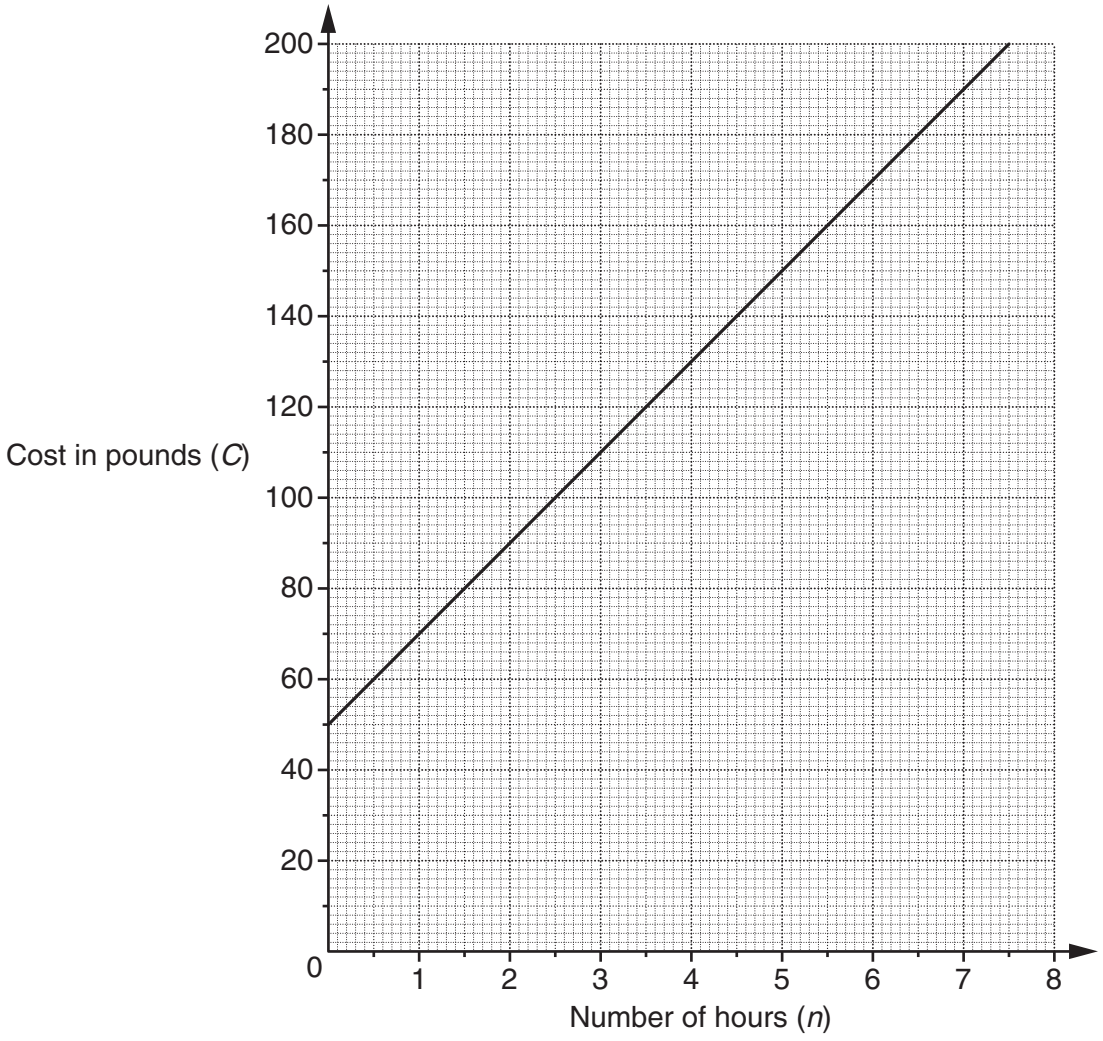
Work out a possible pair of values for the length and the width of this rectangle, showing that the area of rectangle PQRS is bigger than the area of rectangle ABCD.

(b) _____ cm and _____ cm **[4]**

19 Mr Lee needs someone to do repairs in his house.
He can use Handyman Dan or Mr Fixit.

Handyman Dan	**Mr Fixit**
£50 call out fee plus £20 an hour	No call out fee £30 an hour

The graph shows the cost for Handyman Dan.
n stands for the number of hours.
C stands for the cost in pounds.



(a) For Handyman Dan, write down the formula for *C* in terms of *n*.

(a) *C* = _____ **[2]**

(b) The formula for the cost for Mr Fixit is $C = 30n$.

Using the grid on the opposite page, draw the graph which shows the cost for Mr Fixit. **[2]**

(c) **(i)** Write down the coordinates of the point of intersection of the two graphs.

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

(ii) What does this point of intersection represent?

_____

_____ **[1]**

END OF QUESTION PAPER

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