

Friday 13 November 2015 – Morning
GCSE METHODS IN MATHEMATICS
B392/01 Methods in Mathematics 2 (Foundation Tier)


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


| | | | | | | | | | |
|--------------------|--|--|--|--|-------------------|--|--|--|--|
| Candidate forename | | | | | Candidate surname | | | | |
|--------------------|--|--|--|--|-------------------|--|--|--|--|

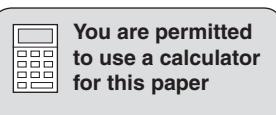
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|---------------|--|--|--|--|--|------------------|--|--|--|
| Centre number | | | | | | Candidate number | | | |
|---------------|--|--|--|--|--|------------------|--|--|--|

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.

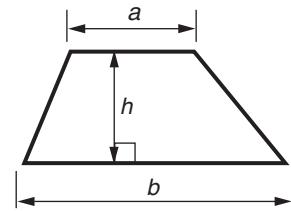
INFORMATION FOR CANDIDATES

- 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 **16** pages. Any blank pages are indicated.

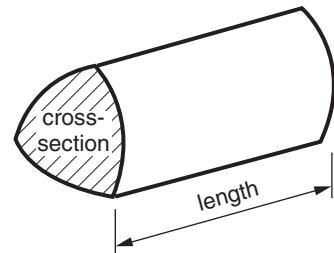


Formulae Sheet: Foundation Tier

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



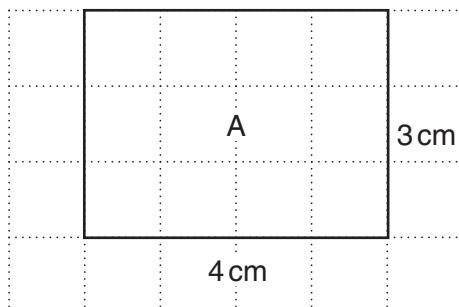
$$\text{Volume of prism} = (\text{area of cross-section}) \times \text{length}$$



PLEASE DO NOT WRITE ON THIS PAGE

Answer **all** the questions.

1 Rectangle A has length 4cm and width 3cm.



(a) Work out the perimeter of rectangle A.

(a) cm [1]

(b) (i) Draw a different rectangle which has the **same perimeter** as rectangle A.
Write the length and width on your rectangle.

[2]



(ii) Work out the area of your rectangle.

(b)(ii) cm² [1]

2 (a) Write down the next term and describe the term-to-term rule for each of these sequences.

| Sequence | Term-to-term rule |
|------------------------|-------------------|
| 100, 93, 86, 79, | |
| 2, 8, 32, 128, | |

[4]

(b) These are the first six terms of the Fibonacci sequence.

1, 1, 2, 3, 5, 8

Each term is the previous two terms added together. So the 3rd term is the 1st and 2nd terms added together, the 4th term is the 2nd and 3rd terms added together and so on.

Work out the next three numbers in the sequence.

(b) 1, 1, 2, 3, 5, 8,,,, [2]

3 (a) Complete.

(i) The cube of 17 is [1]

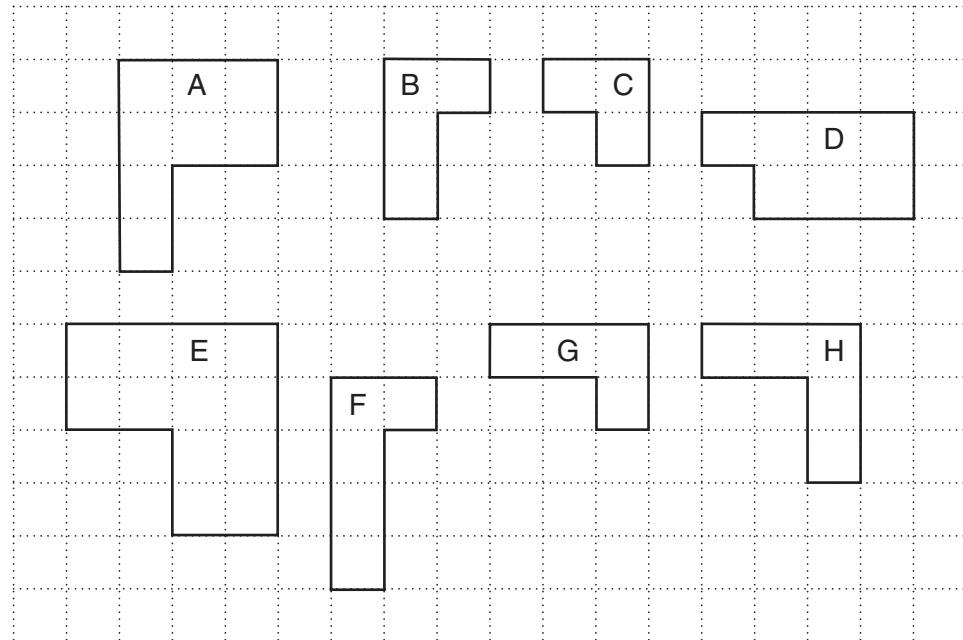
(ii) The square root of 225 is [1]

(b) Calculate.

$$(14.7 + 8.9)(14.7 - 8.9)$$

(b) [2]

4



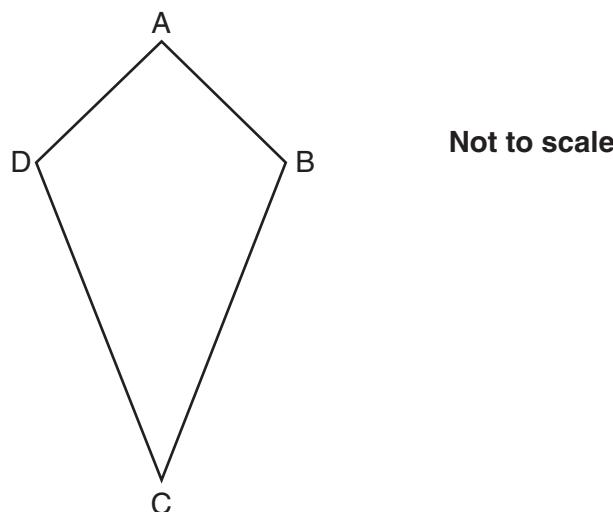
(a) Which two shapes are congruent?

(a) and [1]

(b) Which two shapes are similar but **not** congruent?

(b) and [1]

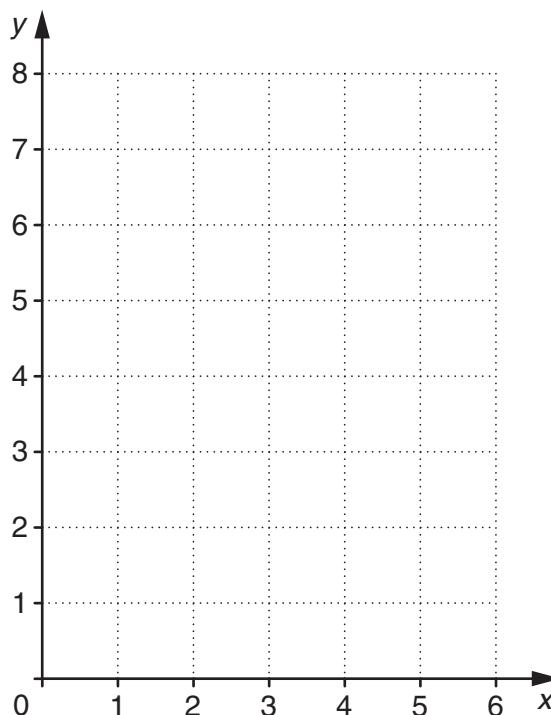
5 ABCD is a kite.



The coordinates of A are (2, 7) and the coordinates of B are (4, 5).

The midpoint of the line AC is (2, 4).

Work out the coordinates of C and D. You may use the grid below to help you.



C (..... ,)

D (..... ,) [4]

6* Jenny is buying cakes and drinks for 20 children.
The cakes and drinks are sold in boxes.

A box of 4 cakes costs £1.30 and a box of 6 cakes costs £1.80.
A box of 5 drinks costs £1.75.

Jenny wants to buy exactly 20 cakes and 20 drinks. She wants to spend the minimum amount of money.

Work out how much Jenny spends altogether.

£ [5]

7 This is a list of six fractions.

$$\frac{1}{10} \quad \frac{1}{5} \quad \frac{3}{8} \quad \frac{3}{5} \quad \frac{2}{3} \quad \frac{3}{4}$$

For each description in the table choose a fraction from the list which matches the description.
Justify your choices.

The first one is done for you.

| Description | Fraction | Justification | |
|--|---------------|--|-----|
| A fraction equivalent to 60% | $\frac{3}{5}$ | $60\% = \frac{60}{100} = \frac{6}{10} = \frac{3}{5}$ | |
| (a) A fraction equivalent to $\frac{15}{40}$ | | | [2] |
| (b) A fraction that is a recurring decimal | | | [2] |
| (c) A fraction which is double another fraction in the list. | | | [2] |

8 Botley community association uses a formula $C = 8n + 15$ to work out the hire charge, £ C , for hiring a room for n hours.

(a) How much does it cost to hire the room for 3 hours?

(a) £..... [2]

(b) Rearrange the formula $C = 8n + 15$ to make n the subject.

(b) $n =$ [2]

(c) Mia spent £55 on hiring the hall.

For how many hours did she hire the hall?

(c) hours [2]

9 (a) This is an inequality.

$$15n - 10 > 80$$

Which of these values of n is a solution of this inequality?

Write *yes* or *no* under each value.

$$n = 5$$

.....

$$n = 5.5$$

.....

$$n = 6$$

.....

$$n = 6.5$$

.....

$$n = 7$$

.....

[2]

(b) Solve.

(i) $\frac{x}{4} = 20$

(b)(i) $x = \dots$ [1]

(ii) $5(x + 4) = 30$

(ii) $x = \dots$ [2]

10 Work out.

(a) (i) 5% of £290

(a)(i) £ \dots [2]

(ii) 18% of £42.50

(ii) £ \dots [2]

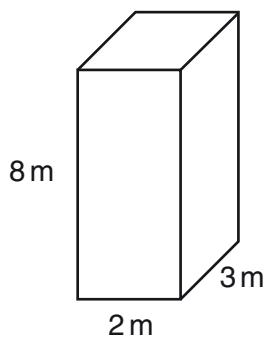
(b) There are 300 pupils at Shore Primary School.
240 pupils walk to school.

What percentage of the pupils walk to school?

(b) \dots % [2]

10

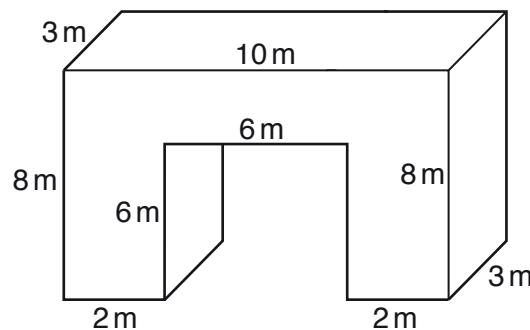
11 (a)



Work out the volume of this cuboid.

(a) m^3 [2]

(b) This prism is in the shape of an arch. All the edges are either horizontal or vertical.



Work out the volume of the prism.

(b) m^3 [4]

12 (a) Calculate.

(i) $24 \div \frac{1}{4}$

(a)(i) [2]

(ii) $\frac{1}{2} \times \frac{1}{4}$

(ii) [1]

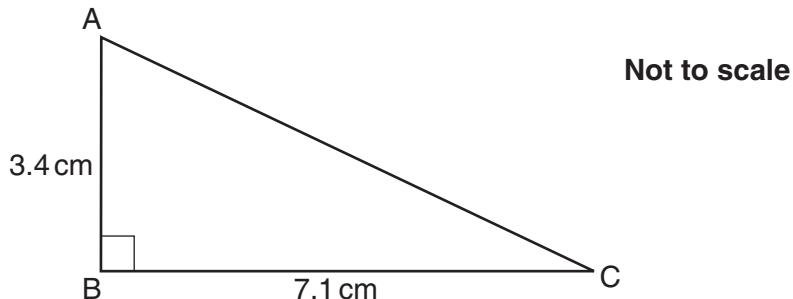
(b) Fill in the missing numbers in this fraction calculation. The missing numbers are whole numbers.

$$\frac{22}{35} \times \frac{25}{32} = \frac{\boxed{}}{7} \times \frac{5}{16} = \frac{\boxed{}}{\boxed{}}$$

[2]

13 ABC is a right-angled triangle.

AB = 3.4 cm and BC = 7.1 cm.



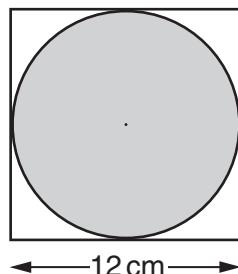
Calculate the length AC.

..... cm [3]

12

14 Andy drew a circle of radius 6cm. He then drew a square around the circle so that the sides just touched the circle. He shaded the circle.

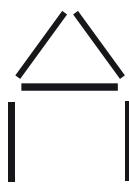
Andy said: About $\frac{3}{4}$ of the square is shaded.



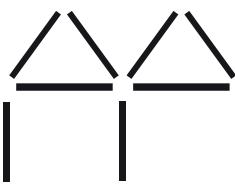
Decide if Andy is correct. You must fully justify your answer.

[6]

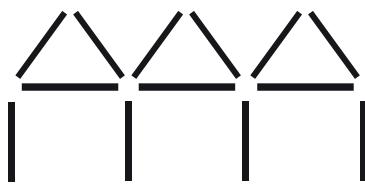
15* Kezia is using sticks to make a sequence of house patterns. One house uses 6 sticks.



1 house
6 sticks



2 houses



3 houses

Kezia has 100 sticks to make one pattern in the sequence.

What is the greatest number of houses she can have in her pattern?
You must explain your reasoning.

.....
.....
.....
.....
.....
.....

[4]

16 (a) Reduce this ratio to its simplest form.

$$24 : 12 : 40$$

(a) [2]

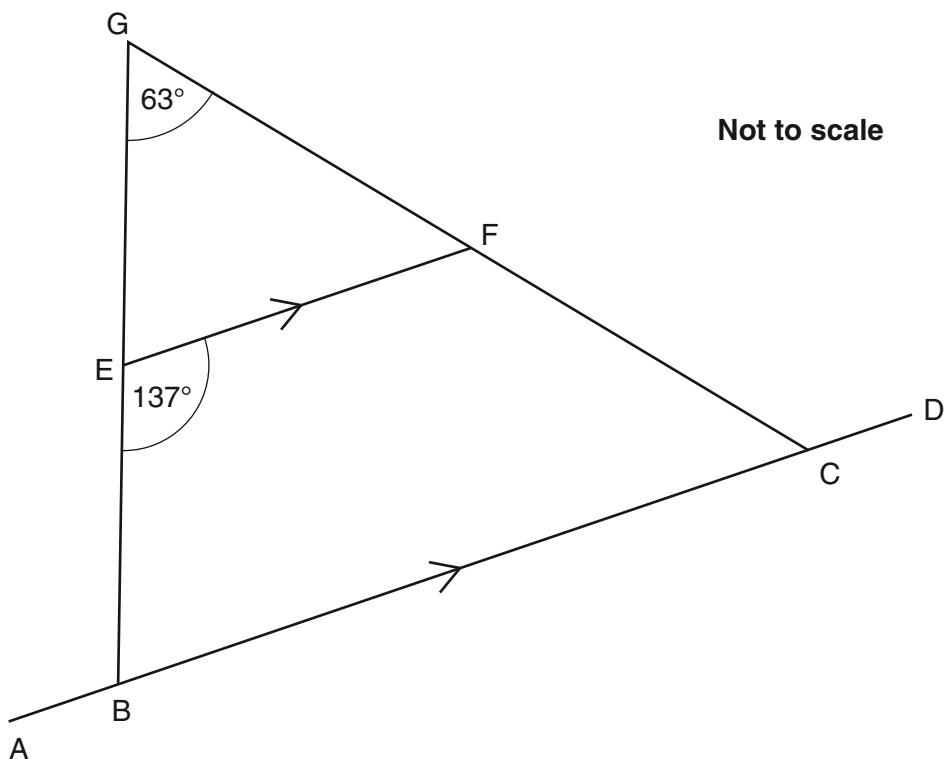
(b) The sides of a triangle are in the ratio 3 : 4 : 5.
The shortest side of the triangle is 21 cm.

Find the perimeter of the triangle.

(b) cm [2]

14

17* In the diagram GB and GC are straight lines. E is on GB and F is on GC. EF is parallel to ABCD. Angle EGF = 63° and angle BEF = 137° .



Calculate angle BCF, giving a reason for each angle you calculate.

.....
.....
.....
.....
.....

[4]

18 Bob has some 1p coins and some 2p coins.
 He has 35p altogether.
 He has 25 coins altogether.
 Bob uses x to stand for the number of 1p coins and y to stand for the number of 2p coins.

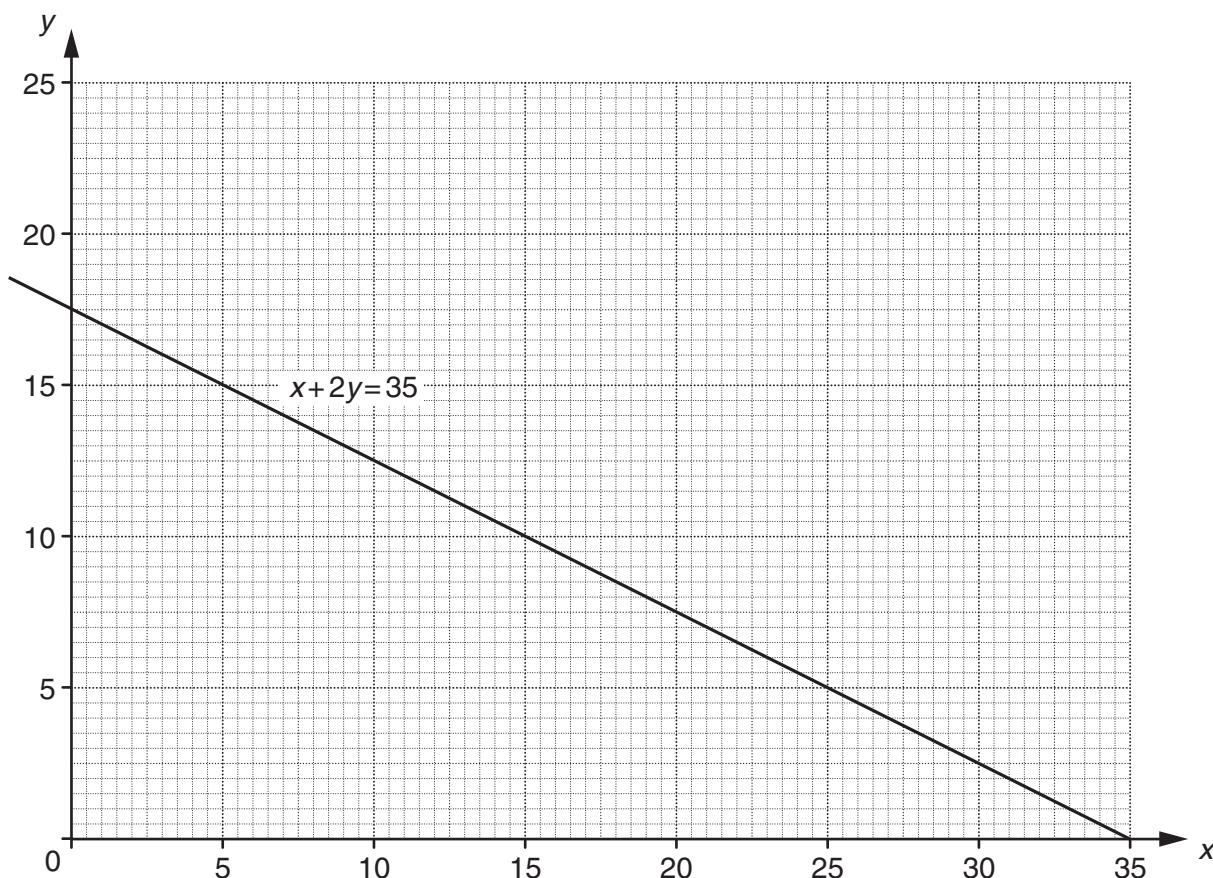
(a) Explain why the equation $x + 2y = 35$ is true for Bob's coins.

.....
 [1]

(b) Write another equation that is true for Bob's coins.

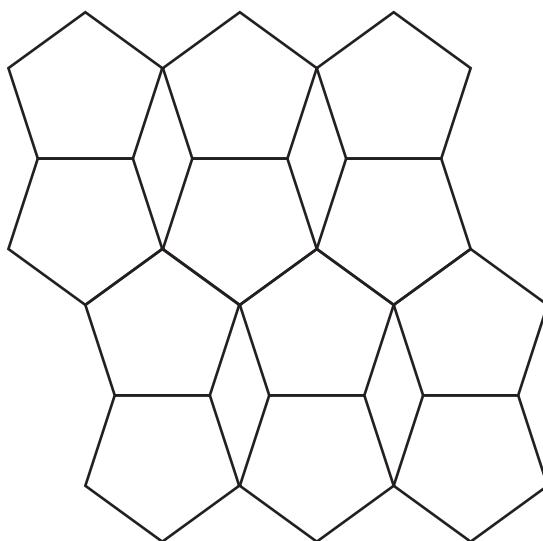
(b) [1]

(c) Find the values of x and y . You may use the graph below.



(c) $x = \dots$, $y = \dots$ [3]

19 The tiling pattern below is made of pentagons and rhombuses.



All the pentagons are regular and congruent.

All the rhombuses are congruent.

Each rhombus has two different sizes of angle in it.

Calculate the sizes of the angles in each rhombus.

.....°,° [5]

END OF QUESTION PAPER



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