AQA

GCSE
METHODS IN MATHEMATICS (LINKED PAIR)

F

Foundation Tier   Unit 1   Algebra and Probability (Section A)

Thursday 26 May 2016   Morning   Time allowed: 45 minutes

Materials
For this paper you must have:
- a calculator
- mathematical instruments.

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- This paper is divided into two sections: Section A and Section B.
- After the 45 minutes allowed for Section A, you must put your calculator on the floor under your seat. You will then be given Section B.
- When you have answered Section B you may work again on Section A but you must **not** use a calculator. It must remain on the floor under your seat.
- At the end of the examination tag Section A and Section B together with Section A on top.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 40.
- The quality of your written communication is specifically assessed in Questions 8 and 9. These questions are indicated with an asterisk (*).
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.
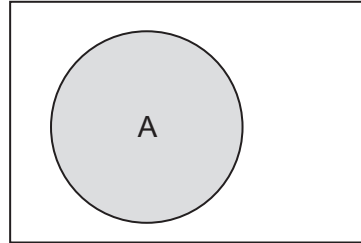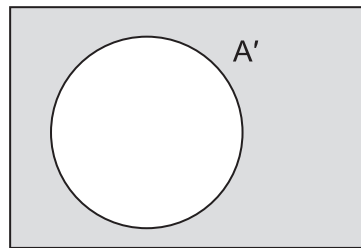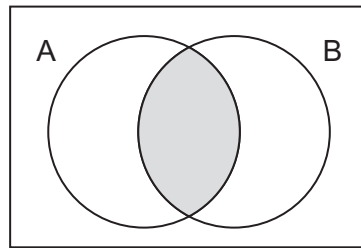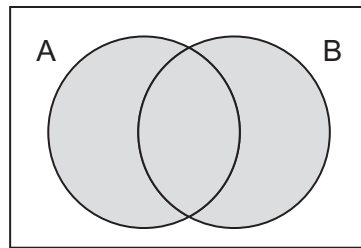- You are expected to use a calculator where appropriate.

Advice
- In all calculations, show clearly how you work out your answer.

Formulae Sheet: Foundation Tier

Set notation

A	
A′	
A ∩ B	
A ∪ B	

Answer **all** questions in the spaces provided.

1 (a) Circle the number that is three and a half thousand.

[1 mark]

3050   3500   35 000   3 000 500

1 (b) How many zeros are there in the number forty million ?

Circle your answer.

[1 mark]

4   5   6   7

1 (c) Circle the fraction equal in value to 0.2

[1 mark]

$\dfrac{1}{2}$ $\dfrac{1}{4}$ $\dfrac{1}{5}$ $\dfrac{1}{20}$

Turn over for the next question

Turn over ▶

2   Here are nine coins.

Alex takes two of the coins.
Beth takes three of the coins.
Chris takes the rest of the coins.

They each take the same amount of money.

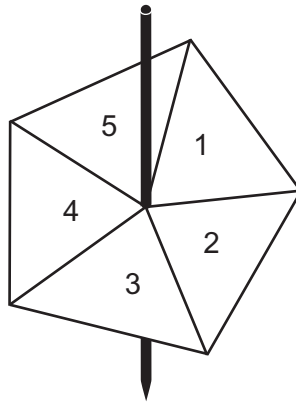Which coins does each person take?

[3 marks]

_____

_____

_____

_____

_____

_____

Answer   Alex _____

Beth _____

Chris _____

3   Here is a fair spinner with five equal sections.

The spinner is spun once.
It lands on a number.

Match each of these events to its position on the probability scale.
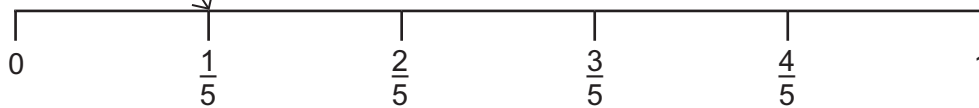One has been done for you.

[3 marks]

| The number is a multiple of 3 | The number is negative | The number is odd | The number is a factor of 5 |

Turn over for the next question

Turn over ▶

6

4   Which of these calculations has the bigger answer?

       Calculation A $(10.2 - 6.7) \times 4.3$

       Calculation B $\sqrt{200 + 25}$

You **must** show your working.

[2 marks]

_____

_____

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       Answer _____

5 100 rulers are in a box.

Some are short and some are long.

Some are plastic and some are wooden.

	Short	**Long**
Plastic	21	40
Wooden	6	33

A ruler is chosen at random.

Complete each sentence with its probability.
Give your answers as fractions, decimals or percentages.

[3 marks]

The probability it is long is _____

The probability it is wooden is _____

The probability it is short **and** plastic is _____

Turn over for the next question

6 n is a whole number.

6 (a)   Circle the expression that **always** represents an odd number.

[1 mark]

$n + 1$ $\qquad\qquad$ $2n - 1$ $\qquad\qquad$ $2n$ $\qquad\qquad$ $3n$

6 (b)   Circle the expression that **always** represents a multiple of 4

[1 mark]

$n + 4$ $\qquad\qquad$ $2n$ $\qquad\qquad$ $2n + 2$ $\qquad\qquad$ $4n$

6 (c)   Give a value of n so that $\qquad 2n + 1 \qquad$ does **not** represent a prime number.
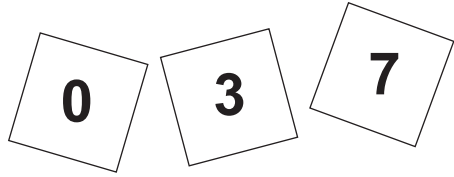
[1 mark]

_____

_____

Answer _____

7 Forty cards each have one number on them.
The number is 0, 3 or 7

$\frac{1}{5}$ of the cards have 3 on them.

The numbers on the forty cards add up to 150

How many cards have 0 on them?

[4 marks]

Answer _____

Turn over for the next question

8 (a) Circle the cube number.

[1 mark]

24   33   64   81

8 (b) Work out $\sqrt[3]{9261}$

[1 mark]

_____

Answer _____

*8 (c) 10 648 is the first cube number with five digits.

Show that there are 25 cube numbers with five digits.

[3 marks]

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*9   There are 140 counters in box A.
There are 220 counters in box B.

The number of counters in box A is **increased** by 20%

The number of counters in box B is **decreased** by $\frac{1}{4}$

Which box now has more counters?
You **must** show your working.

[4 marks]

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Answer _____

Turn over for the next question

9

Turn over ▶

10 (a)   Factorise $x^2 - 2x$

[1 mark]

_____

Answer _____

10 (b)   Solve $\dfrac{10 - 2x}{3} = 6$

[3 marks]

_____

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_____

$x =$ _____

11 Here is a six-sided dice numbered 1 to 6
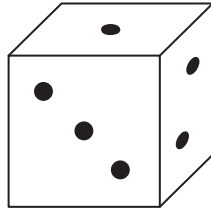
Describe how the dice can be tested to see if the dice is fair.

[2 marks]

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Turn over for the next question

6

Turn over ▶

12 (a) Solve $\quad$ $3y = 24$

[1 mark]

_____

$y =$ _____

12 (b) Expand and simplify $\quad$ $3(a + 2) + 4(a - 8)$

[2 marks]

_____

_____

_____

Answer _____

12 (c) Rearrange the formula $\quad$ $p = rw$ $\quad$ to make r the subject.

[1 mark]

_____

Answer _____

END OF SECTION A

4

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