AQA

GCSE
METHODS IN MATHEMATICS (LINKED PAIR)

H

Higher Tier   Unit 1   Algebra and Probability (Section B)

Wednesday 2 November 2016   Morning   Time allowed: 45 minutes

Materials
For this paper you must have:
- mathematical instruments.
You must **not** use a calculator.

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.
- You must **not** use your calculator in Section B. Your calculator must remain on the floor under your seat.
- 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 Question 25
  This question is 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.

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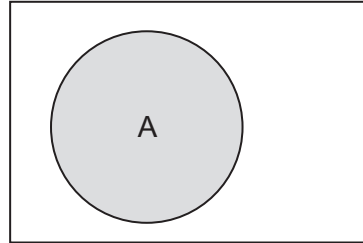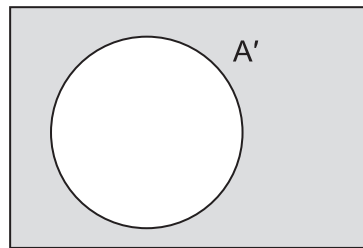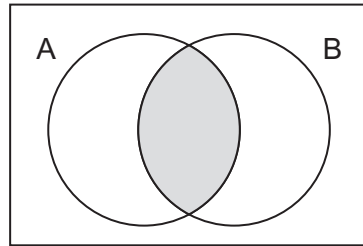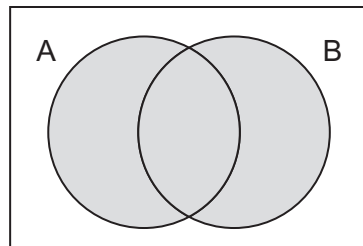 In all calculations, show clearly how you work out your answer.

Formulae Sheet: Higher Tier

Set notation

A

A′

$A \cap B$

$A \cup B$

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

14 $7.2 \times 3.1 = 22.32$

14 (a)   Work out 0.72×3.1

[1 mark]

Answer _____

14 (b)   Work out $2232 \div 0.31$

[1 mark]

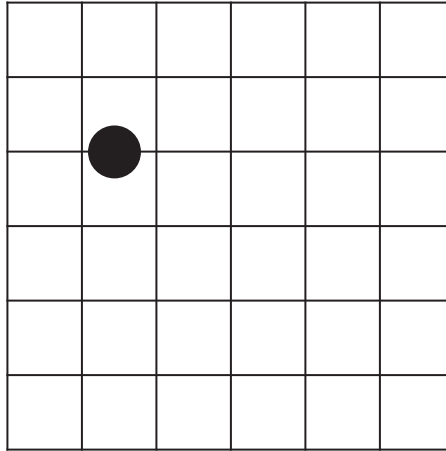Answer _____

14 (c)   Work out 1.44×3.1

[1 mark]

Answer _____

Turn over ▶

3

15 A coin is rolled onto a square grid 10 times.

The place the coin stops is recorded each time.

The table shows the results.

	Coin stops completely inside one square	**Coin stops on at least one line**
Number of times	1	9

15 (a) Work out the relative frequency of the coin stopping completely inside one square.

[1 mark]

Answer _____

15 (b) Is your relative frequency in part (a) likely to be a good estimate of the probability of the coin stopping completely inside one square?
Give a reason for your answer.

[1 mark]

15 (c) The coin is rolled 10 more times.

Which statement is correct?
Tick a box.

[1 mark]

The results will definitely be the same as the first 10 ☐

The results will probably be the same as the first 10 ☐

The results will probably be different from the first 10 ☐

The results will definitely be different from the first 10 ☐

16 Expand and simplify $3(x + 4) + 5(2x - 1)$

[2 marks]

_____

_____

_____

_____

Answer _____

5

17 a and b are whole numbers.
$a^b = 64$

Work out three possible pairs of values for a and b.

[2 marks]

Answer $a =$ _____ $b =$ _____

$a =$ _____ $b =$ _____

$a =$ _____ $b =$ _____

18 You can use these steps to work out the sum of consecutive integers starting with 1

Steps	Example To work out the sum of the integers from 1 to 8 $(1 + 2 + 3 + 4 + 5 + 6 + 7 + 8)$
Write down the biggest integer	8
Add 1	9
Multiply these numbers	$8 \times 9 = 72$
Divide by 2	$72 \div 2 = 36$
This is the answer	36

The sum of the integers from 1 to 50 is 1275

Work out the sum of the integers from 51 to 100

[3 marks]

Answer _____

5

19 A footballer scored all her goals with her left foot, right foot or head.

She scored,

$\frac{1}{4}$ with her left foot

$\frac{2}{3}$ with her right foot

7 with her head.

How many goals did she score with her **right** foot?

[5 marks]

Answer _____

20 Work out $(7.63 \times 10^5) + (4.82 \times 10^4)$

Give your answer in standard form.

[3 marks]

Answer _____

21 Solve $4n > n - 27$

[2 marks]

Answer _____

10

22 What percentage of 8 is 0.76?

[2 marks]

Answer _____ %

23 Work out the equation of the line,

parallel to the line with equation $y - 2x = 5$

and

passing through the point (–3, –10)

[3 marks]

Answer _____

24   In a team of 11 players,

8 are girls and 3 are boys.

Two of the players are picked at random.

Work out the probability that **at least** one boy is picked.

[3 marks]

_____

Answer _____

Turn over for the next question

8

*25   Show that $\dfrac{\sqrt{50} + \sqrt{98}}{\sqrt{18}}$ simplifies to an integer.

[4 marks]

26 $3ax^2 - 2bx^2 + 7ax + 2bx + a + 5b \equiv 13x^2 + 57x + c$

Work out the value of c.
You **must** show your working.

[5 marks]

Answer _____

END OF QUESTIONS

9

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