GCSE LINKED PAIR PILOT

WJEC CBAC

4363/01

METHODS IN MATHEMATICS
UNIT 1: METHODS (NON-CALCULATOR)
FOUNDATION TIER

P.M. MONDAY 11 June 2012

$1\frac{1}{2}$ hours

CALCULATORS ARE NOT TO BE USED FOR THIS PAPER

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	6	
2	6	
3	13	
4	4	
5	3	
6	7	
7	7	
8	6	
9	2	
10	6	
11	3	
12	4	
13	3	
14	4	
15	6	
TOTAL MARK		

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

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

Take π as 3·14.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

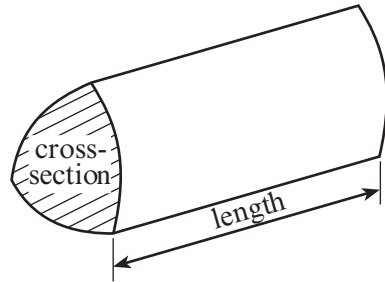The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **10**.

Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$
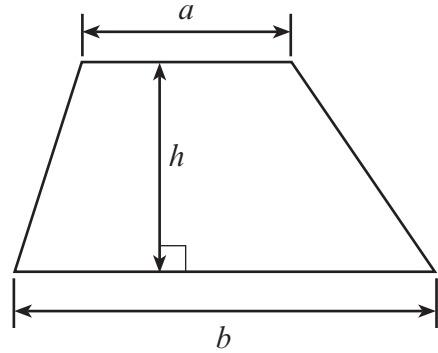
Volume of prism = area of cross-section × length

1. From the numbers,

27	13	9	10	48	8

write down

- the answer to 4 multiplied by 12 ....

- a factor of 30 ....

- a prime number ....

- a square number ....

- the value of 3^3 ....

- $\sqrt{64}$ ....

[6]

2. *(a)* Write the number thirteen thousand, five hundred and six in figures.

....
[1]

(b) Write the number 7 500 000 in words.

....

....
[1]

(c) What is the value of the 9 in the number 239 815?

....
[1]

(d) Using all the digits **6   7   3   8** write down the smallest odd number.

....

....
[1]

(e) Estimate the answer to 98 × 5·1

....

....
[2]

3. Calculate each of the following.

(a) $4 + 3 \times 7 - 6$

[1]

(b) $592 - 137$

[1]

(c) 63×8

[1]

(d) $602 \div 14$

[2]

(e) 519×43

[3]

(f)   Add $\dfrac{7}{10}$ to 5·92

....

....

....

[2]

(g)   New pylons are needed in an area of Wales.
- The pylons are in a straight line.
- The distance between the first and last pylon is 9 km.
- The pylons need to be 0·5 km apart.

How many pylons, in total, are needed for the 9 km stretch of land?

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....

....

[3]

4. On the probability scale shown below, mark the point**s A, B, C** and **D** where:

    A   is the probability that when a fair dice is thrown an even number is obtained

    B   is the probability that the day after Saturday will be Sunday

    C   is the probability that the next object you see flying in the sky will be a live pink elephant

    D   is the probability that a marble picked out of a bag containing 1 red, 1 blue, 1 green and 1 black marble will be blue.

0   1
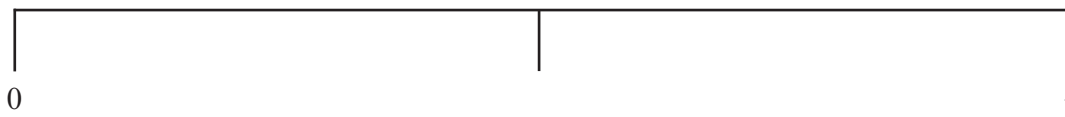
[4]

5. In a game, a player is asked to select as many cards as possible from the ones shown below and add together the numbers on the selected cards to make a total.

| +3 | -7 | -1 | 0 | +2 | -4 | +6 | -5 |
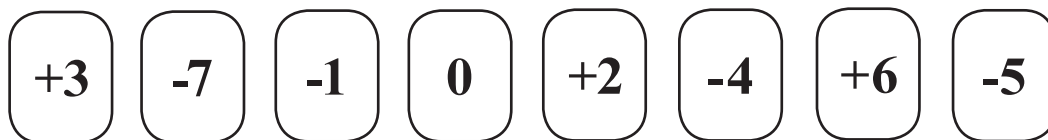
Using as many cards as possible, show how a player could achieve a total of –2.

[3]

6. *(a)* Simplify $4y + 9y - 7y$.

....

[1]

(b) Simplify $5a + 7b + 8a + 5b$.

....

[2]

(c) Given that $C = 2p + m$ find the value of m when $C = 20$ and $p = 6$.

....

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....

[2]

(d) Rods of different lengths are shown below.

$7q$

$6q + 3$

$5q$

$4q - 2$

$8q + 1$
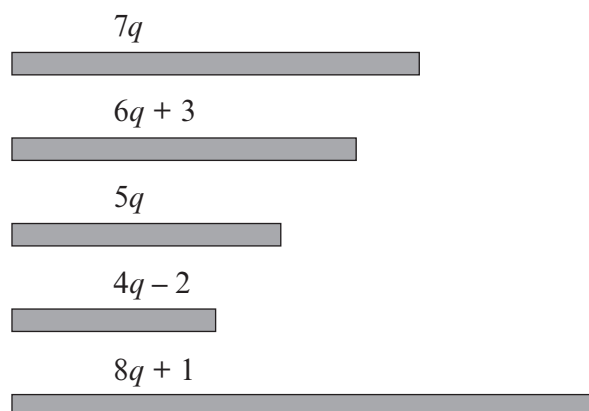
Diagrams not drawn to scale

The rods are placed end to end.
Write down an expression, in its simplest form, for the total length of the rods.

....

....

....

[2]

7. *(a)* Find the size of angle *a*.
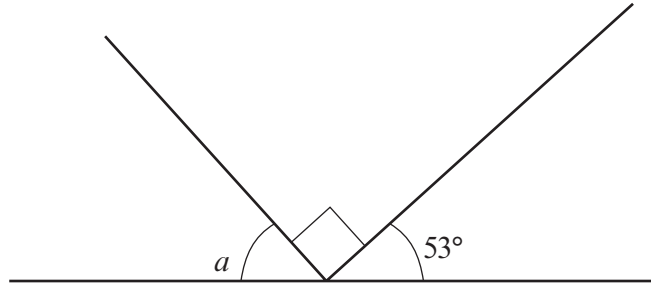
Diagram not drawn to scale

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[2]

(b) Find the size of angle *b*.
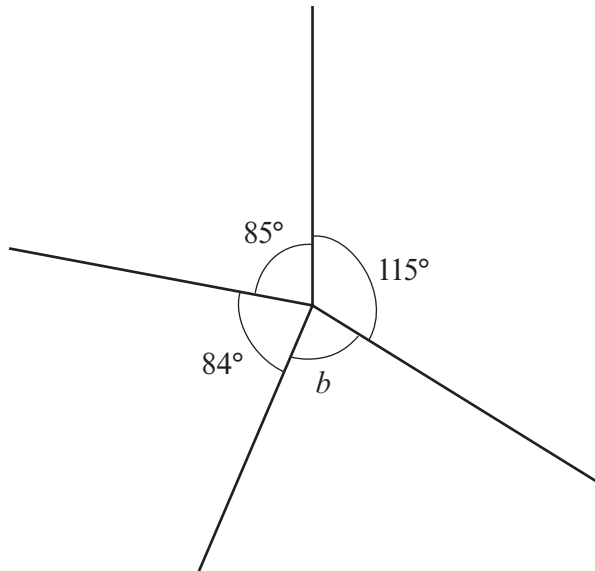
Diagram not drawn to scale

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[2]

(c) Find the size of angle *c*.

150°

125°

c
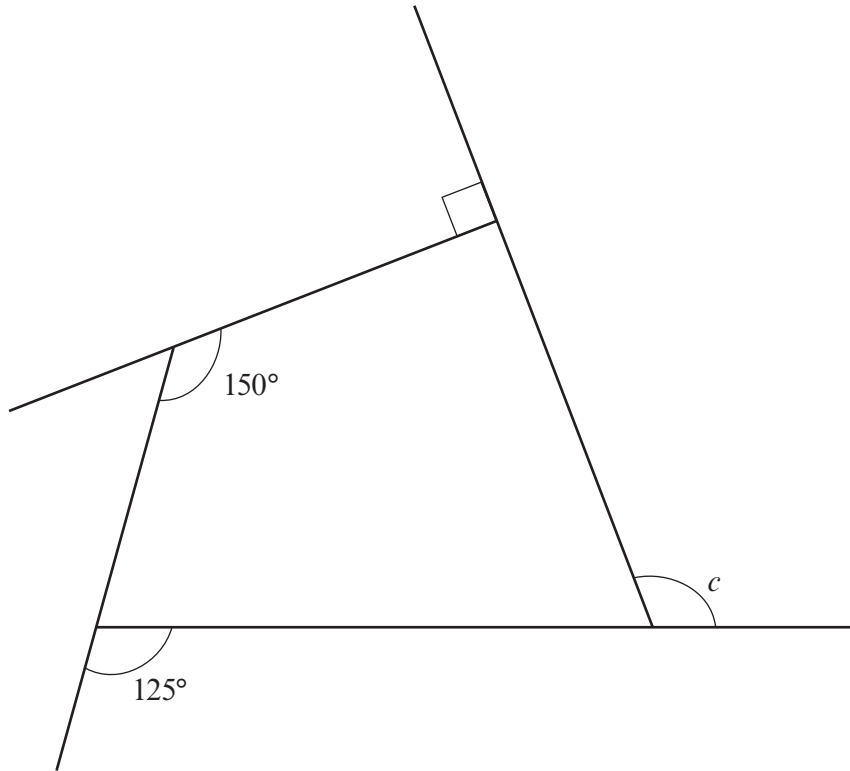
Diagram not drawn to scale

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[3]

8. Two fair dice are thrown.

The two numbers obtained are multiplied together to get the total score.
The table below shows some of the possible total scores.

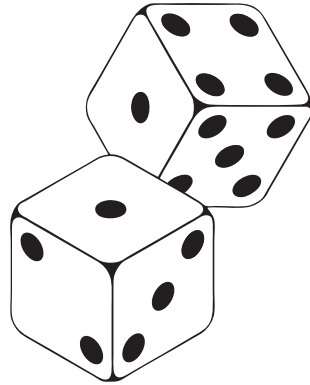| Second dice						
6	6	....	....	....	....	....
5	5	....	....	....	....	....
4	4	8	....	....	....	....
3	3	6	....	....	....	....
2	2	4	6	8	10	....
1	1	2	3	4	5	6
	1	2	3	4	5	6

First dice

(a) Complete the table to show all the possible total scores. [2]

(b) What is the probability of getting a total score of 20 or more?

....

.... [2]

(c) If the two dice are thrown 720 times, how many times would you expect to get a total score of 20 or more?

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....

.... [2]

9. Ben needs to tile his kitchen floor and decides to use the two types of tiles shown in the diagram.
By drawing more tiles in the diagram, show that the tiles will tessellate.

[2]
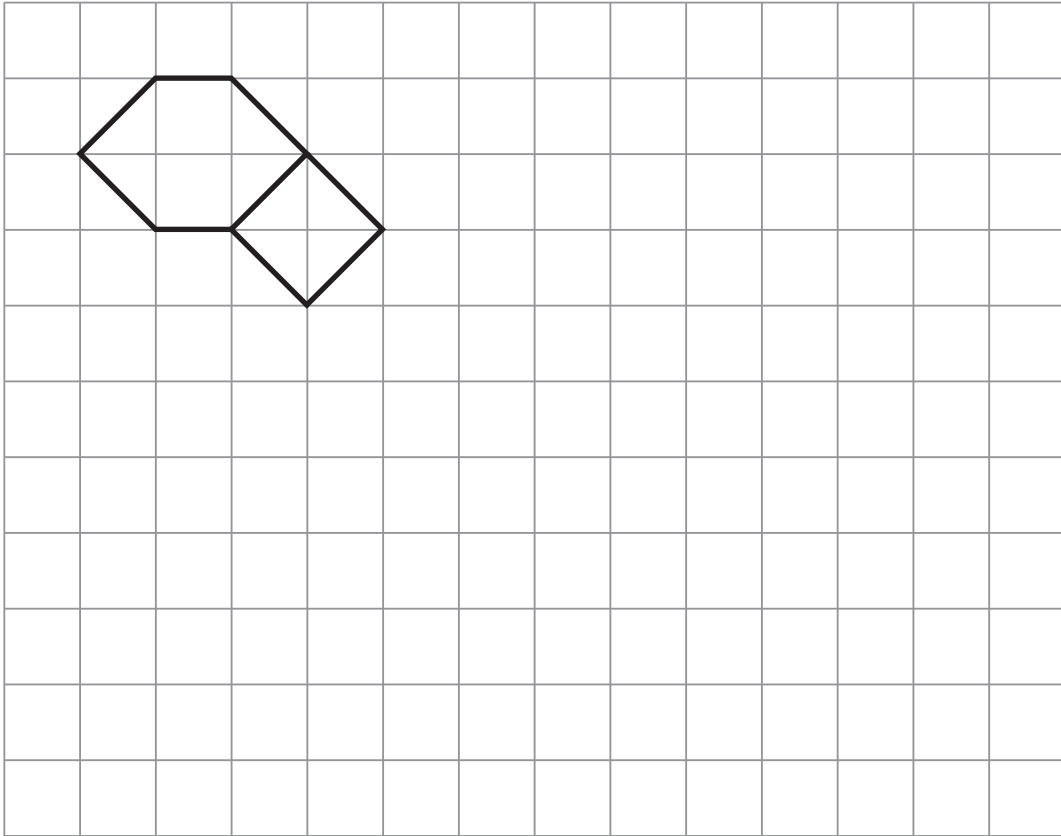
10. *You will be assessed on the quality of written communication in this question.*

A chef needs to cook a 4·5 kilogram turkey.

The following rule is used to calculate the cooking time:

"Cook for 40 minutes per kilogram and then add an extra 25 minutes."

The chef wants the turkey to be ready at 1:30 p.m.

What is the latest time that the chef should begin cooking the turkey?

[6]

11. The table shows the values of $y = x^2 - 3$ for values of x from -3 to 3.

x	-3	-2	-1	0	1	2	3
$y = x^2 - 3$	6	1	-2	-3	-2	1	6

(a) On the graph paper below, draw the graph of $y = x^2 - 3$ for values of x between -3 and 3.

[2]
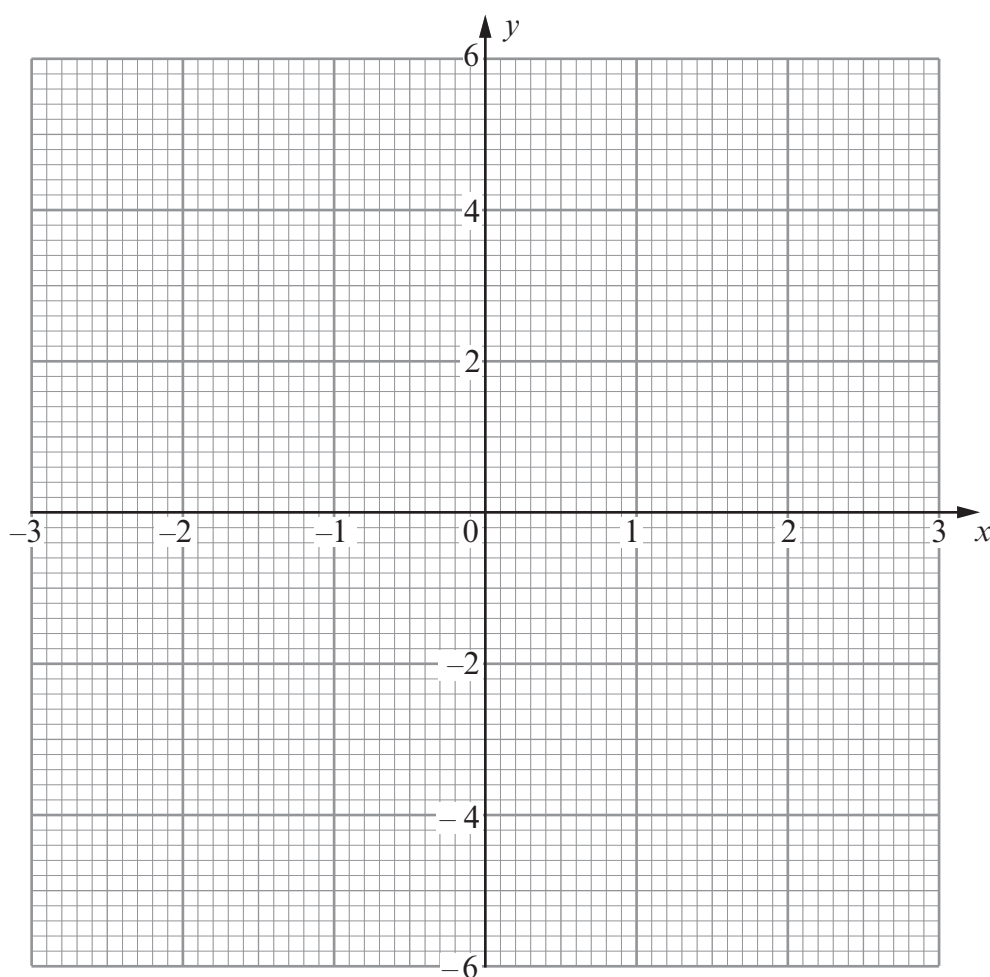
(b) Write down the x-values of the points where the graph cuts the x-axis.

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[1]

12. The coordinates of three vertices of a parallelogram are (5, –2), (–3, –2) and (–2, –6).
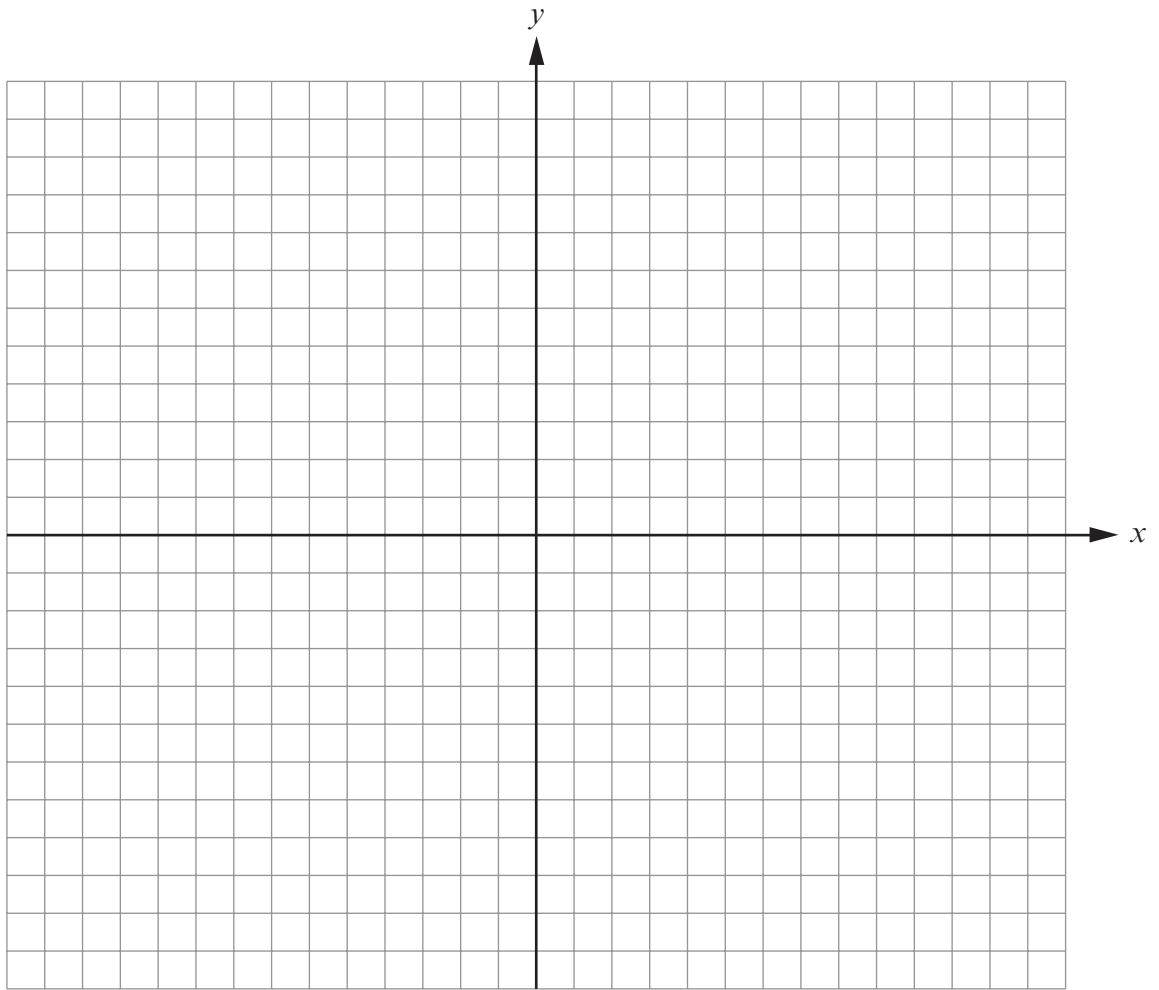
(a) Find the coordinates of a fourth vertex of the parallelogram.

....

....

(........................... , ...)

[2]

(b) Find the coordinates of the mid point of a diagonal of your parallelogram.

....

....

(........................... , ...)

[2]

13. Two sets of rods of length 1, 2, 4, 8, 16 and 32 cm are available to make shapes.

1 cm	2 cm	4 cm	8 cm	16 cm	32 cm
1 cm	2 cm	4 cm	8 cm	16 cm	32 cm

Rods are joined end to end, with all parts of the rods forming part of the shape.

(a) Show how you could use some of these rods to make an equilateral triangle with sides of length 10 cm.

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...

[1]

(b) What would be the lengths of the sides of the **largest** possible equilateral triangle that could be made using these rods? You must state which rods are used and how the equilateral triangle is to be made.

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....

....

....

[2]

14. Write down the *n*th term of the following sequences.

    (a)   6, 13, 20, 27, ...

....

....

[2]

    (b)   26, 20, 14, 8, ...

....

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[2]

15. *(a)*   Divide £2680 in the ratio $5:3:2$.

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[3]

    (b)   Write 1200 as a product of prime factors using index notation.

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[3]