

Double Award GCSE Mathematics

GCSE 2

Exemplar Paper 1

(Foundation Tier)

Time allowed: 1 hour 30 minutes

Paper total: 80 marks

A calculator is allowed on this paper.

This paper is one of a set of 6 exemplar papers written by MEI, covering the Foundation and Higher Tiers of GCSE 1 and 2.

The aim of these papers is to inform public discussion. They do not contribute to any existing GCSE qualification.

June 2006

Section A

A1. Write 239 correct to 2 significant figures. (2 marks)

A2. **You should not use a calculator on this question; you must show working.**

Simplify $1\frac{1}{2} \times 1\frac{1}{3}$ (3 marks)

A3. Write down all the factors of 108. (3 marks)

A4. Evaluate

(a) $(-2) + (-3)$ (1 mark)

(b) $(-4) - (-7)$ (1 mark)

(c) $\frac{(-3) \times (-4)}{(-6)}$ (2 marks)

A5. Write down the values of

(a) $64^{\frac{1}{2}}$

(b) 3^{-2} (2 marks)

A6. Simplify $3x + 5 - 2y + 6x + 2y - 7$ (2 marks)

A7. Factorise $6x - 12$ (1 mark)

A8. Write down a formula for the n th term of this sequence:

2, 5, 8, 11, 14, 17,

(2 marks)

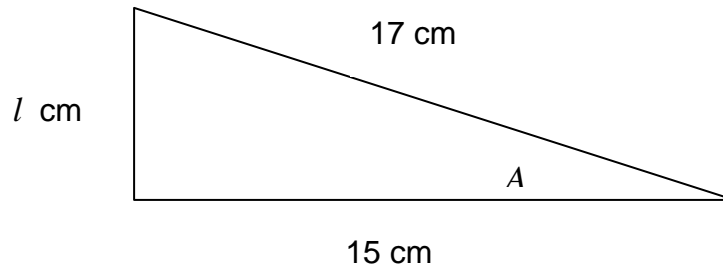
A9. Work out $\begin{pmatrix} 2 \\ 3 \end{pmatrix} + \begin{pmatrix} 5 \\ -1 \end{pmatrix}$

(2 marks)

A10.

(a) Calculate the length l cm in this triangle.

(2 marks)



(b) Calculate also the angle A .

(3 marks)

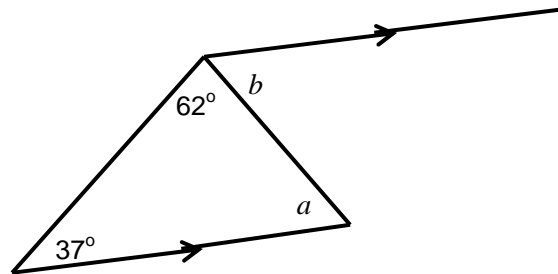
A11. For each line in the table, write down whether it shows an equation, a formula, an expression or an identity.

(3 marks)

$3x + y$	
$A = lb$	
$3(x - y) = 3x - 3y$	

- A12. State the size of angles a and b in the diagram below.
Give reasons for your answers.

(4 marks)

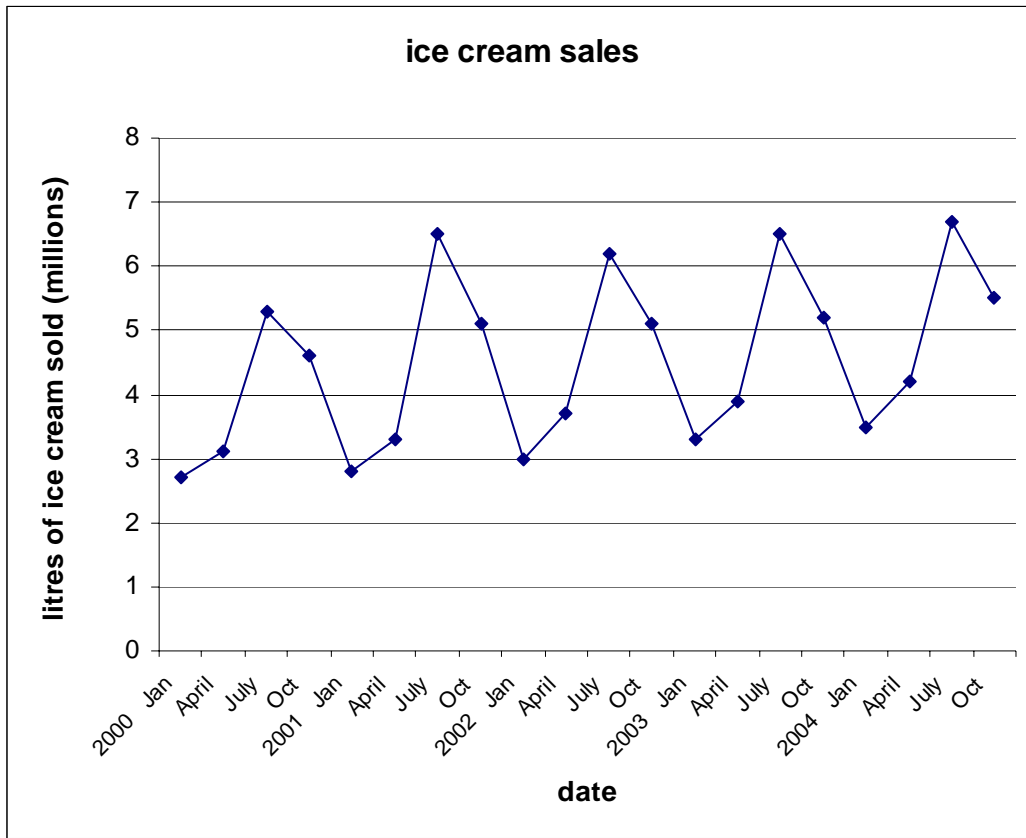


- A13. Jane is doing a survey about school dinners among year 7 pupils.
There are 81 girls and 69 boys in year 7.

How many girls and boys should she choose to get a stratified random
sample of 50 students?

(4 marks)

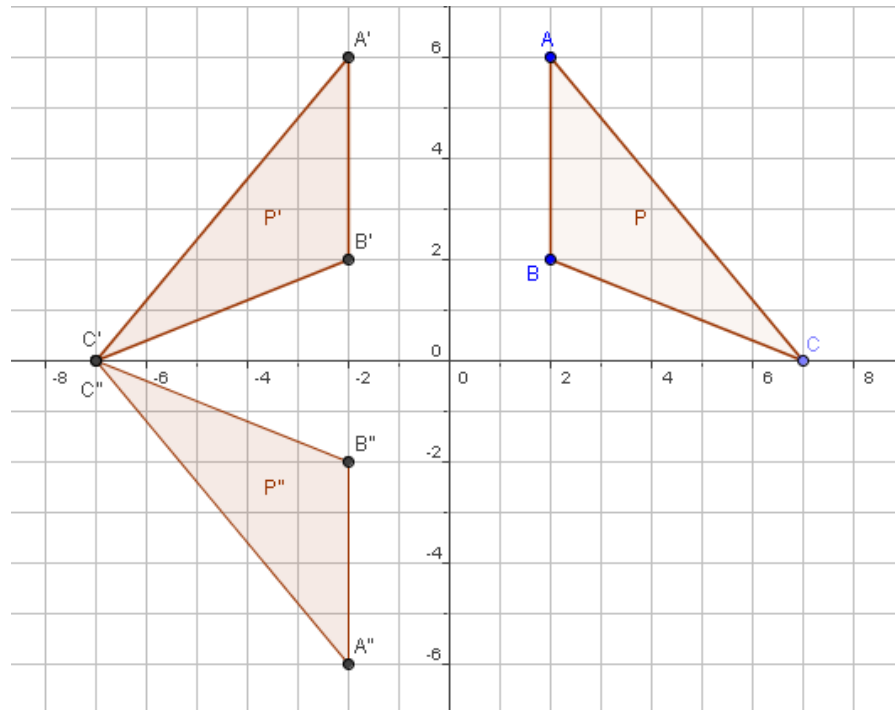
A14. The graph below shows how many litres of ice cream was sold by a local producer each quarter over a five year period.



- (a) What feature of the graph suggests that 2002 was a hot summer?
(1 mark)
- (b) Comment on the overall trend of the sales.
(1 mark)
- (c) If the trend continues, estimate how many million litres of ice cream will be sold between January 2005 and April 2005.
(1 mark)

Section B

B1.



- (a) State the transformation that maps triangle P onto triangle P' .
(2 marks)
- (b) State the transformation that maps triangle P' onto triangle P'' .
(1 mark)
- (c) What single transformation maps triangle P onto triangle P'' ?
(3 marks)
- (d) A fourth triangle P''' is added to the diagram to make it symmetrical about the x -axis and about the y -axis.

The triangle P' is given two transformations to form P''' .

First it is rotated through 180° about the point A' .

Then the resulting triangle is given a translation $\begin{pmatrix} p \\ q \end{pmatrix}$.

State the values of p and q .

(4 marks)

B2. A quantity P is directly proportional to a quantity Q . The constant of proportionality is k .

(a) Write down an equation connecting P and Q .
(1 mark)

When $Q = 4$, $P = 10$.

(b) Find the value of k .
(1 mark)

(c) Find the value of P when $Q = 7$.
(1 mark)

(d) Find the value of Q when $P = 11$.
(1 mark)

The quantity Q is related to a third quantity, R , by the equation

$$Q = \frac{c}{R}.$$

(e) Describe the relationship between Q and R in words.
(1 mark)

When $R = 3$, $Q = 10$.

(f) Find the value of c .
(1 mark)

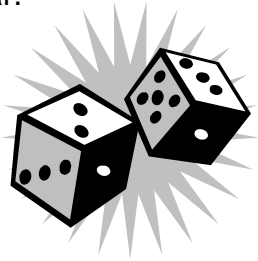
(g) Find the value of Q when $R = 6$.
(1 mark)

(h) Find the value of R when $Q = 15$.
(1 mark)

(i) Sketch a graph to show the connection between P and Q .
(1 mark)

(j) Sketch a graph to show the connection between Q and R .
(2 marks)

- B3. Tom is designing a game for a stall at a charity bazaar. He has renumbered two fair dice: one is numbered 1, 2, 2, 3, 3, 3 and the other is numbered 1, 3, 5, 7, 9, 11. Customers will pay 10p a go and will get a prize if they throw a total of 12, or more, on the two dice.



- (a) By showing all possible outcomes in the table below, or otherwise, work out the probability of winning a prize.

		<i>Number on one dice</i>					
		tot	1	2	2	3	3
Number on other dice	1	2	3				
	3	4	5				
	5	6					
	7						
	9						
	11						

(4 marks)

- (b) Tom has bought 48 small bars of chocolate to use as prizes at a cost of £1.19 for 6. How many customers does he need before he makes a profit?

(3 marks)

- (c) About how many customers can he have before he runs out of chocolate?

(2 marks)

B4.

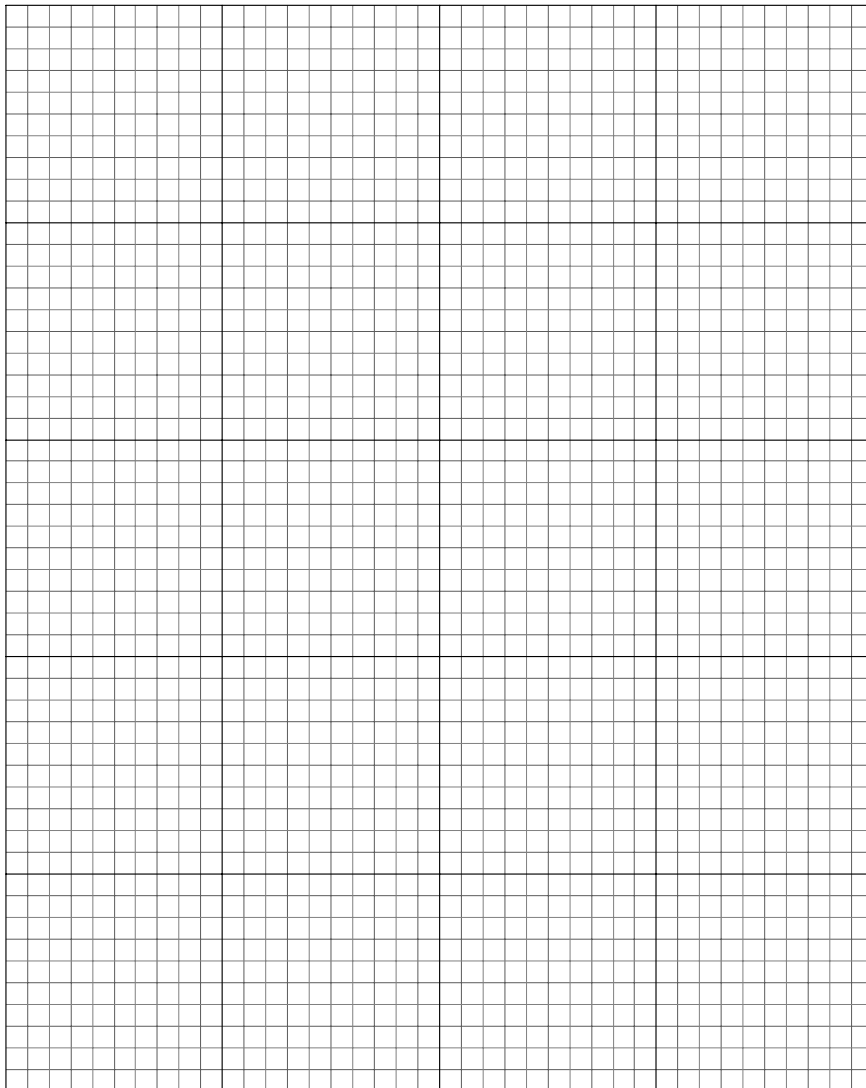
(a) Fill in the table of values below for $y = x^3$.

x	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2
y									

(3 marks)

(b) Draw the graph of $y = x^3$ on the grid below.

(2 marks)



(c) On the same grid, draw the line $y = 2x - 1$.

(2 marks)

(d) Use your graphs to solve the equation $x^3 = 2x - 1$.

(3 marks)