

Write your name here

Surname

Other names

Pearson Edexcel
International GCSE

Centre Number

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Candidate Number

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Mathematics B

Paper 2



Tuesday 20 May 2014 – Afternoon
Time: 2 hours 30 minutes

Paper Reference

4MB0/02

You must have: Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- **Calculators may be used.**

Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.
- Without sufficient working, correct answers may be awarded no marks.

Turn over ►

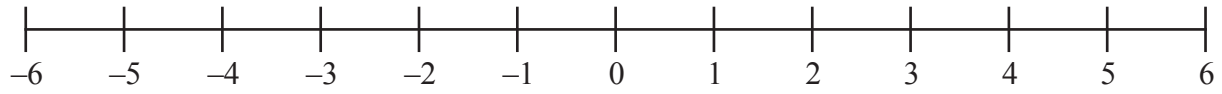
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Question 5 continued



A series of horizontal dotted lines for writing the answer.

(Total for Question 5 is 9 marks)



6 There are 159 people living in a street.

The table below shows information about the number of people living in each of 30 houses in the street.

Number (n) of people living in a house	Number of houses with n people living in the house
1	2
2	3
3	1
4	4
5	3
6	6
7	8
8	2
9	1

(a) Find

- (i) the modal number of people living in a house,
- (ii) the median number of people living in a house,
- (iii) the mean number of people living in a house.

(5)

Two houses in the street are chosen at random.

(b) Calculate the probability that 4 people live in one of the houses and 2 people live in the other of the houses.

(2)

One of the people living in the street is chosen at random.

(c) Find the probability that this person lives in a house in which at least 5 people live.

(2)

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7 The points (2, 3), (4, 3) and (4, 4) are the vertices of a triangle A .

(a) On the grid, draw and label triangle A .

(1)

Triangle A is transformed to triangle B under the translation $\begin{pmatrix} 0 \\ -5 \end{pmatrix}$.

(b) On the grid, draw and label triangle B .

(1)

Triangle B is transformed to triangle C under the transformation with matrix \mathbf{T} where

$$\mathbf{T} = \begin{pmatrix} -2 & 0 \\ 0 & -2 \end{pmatrix}$$

(c) Find the coordinates of the vertices of triangle C .

(2)

(d) On the grid, draw and label triangle C .

(1)

Triangle B is mapped to triangle C under the transformation with matrix \mathbf{T} by an anticlockwise rotation about the origin of 180° followed by an enlargement with centre the origin.

(e) Find the scale factor of this enlargement.

(1)

Triangle C is transformed to triangle D under the translation $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$.

(f) On the grid, draw and label triangle D .

(1)

Triangle A is transformed to triangle D by a single enlargement.

(g) Describe fully this enlargement.

(2)



Question 7 continued

Handwriting practice area consisting of 25 horizontal dotted lines.



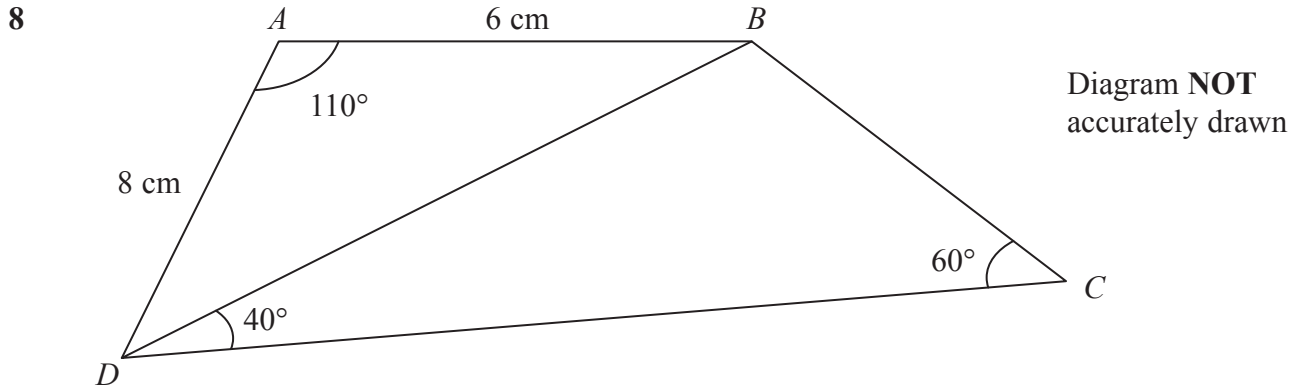


Figure 1

Figure 1 shows quadrilateral $ABCD$ with diagonal BD .

Given that $\angle BAD = 110^\circ$, $AB = 6$ cm and $AD = 8$ cm,

(a) calculate the length, in cm to 3 significant figures, of BD . (3)

Given also that $\angle BDC = 40^\circ$ and $\angle BCD = 60^\circ$, calculate the length, in cm to 3 significant figures, of

(b) BC , (3)

(c) AC . (5)

$$\left[\begin{array}{l} \text{Sine Rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \\ \text{Cosine Rule: } a^2 = b^2 + c^2 - 2bc \cos A \end{array} \right]$$



Question 8 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

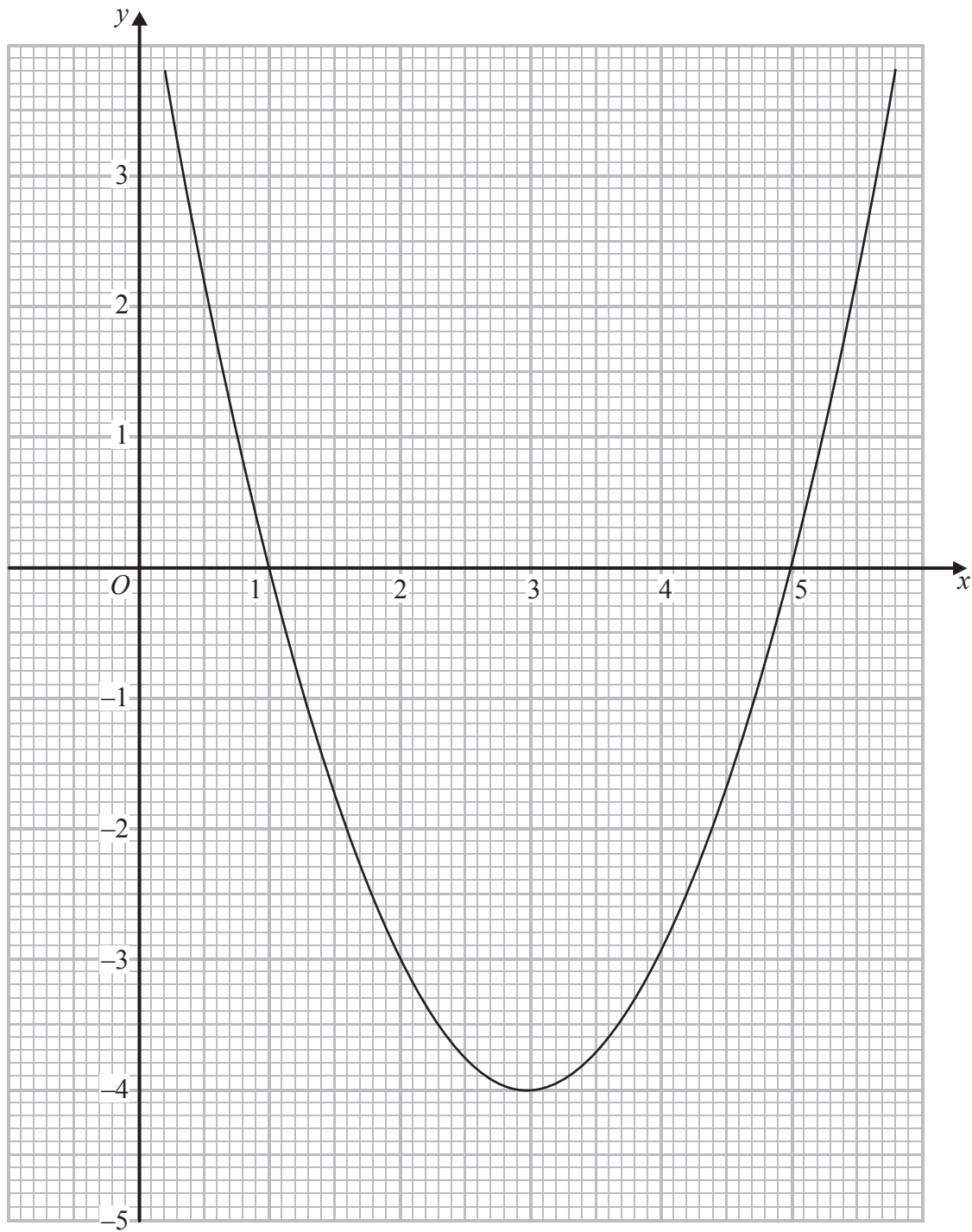


Question 8 continued

A large rectangular area with rounded corners, containing 25 horizontal dotted lines for writing.



Question 9 continued



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Question 9 continued

A series of horizontal dotted lines for writing.



Question 10 continued

A series of horizontal dotted lines for writing.



11

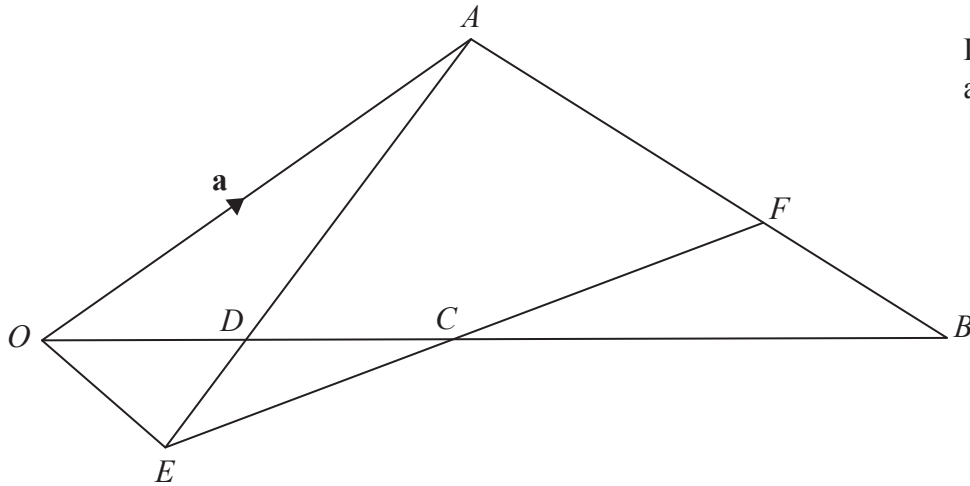
Diagram NOT
accurately drawn

Figure 2

In Figure 2, the points O , A and B are such that $\vec{OA} = \mathbf{a}$ and $\vec{OB} = 2\mathbf{b}$.

The point C is the midpoint of OB .

The point F is on the line AB such that $AF : FB = 2 : 1$

(a) Express in terms of \mathbf{a} or \mathbf{b} or \mathbf{a} and \mathbf{b} , simplifying your answers where possible,

(i) \vec{AB} , (ii) \vec{BC} , (iii) \vec{FB} , (iv) \vec{FC} .

(5)

The point D is on the line OB such that $OD : OB = 1 : 4$

(b) Express in terms of \mathbf{a} or \mathbf{b} or \mathbf{a} and \mathbf{b} , simplifying your answers where possible,

(i) \vec{OD} , (ii) \vec{AD} .

(3)

The point E is such that ADE and FCE are straight lines.

Given that $\vec{FE} = \lambda \vec{FC}$, where λ is a scalar,

(c) find an expression, in terms of \mathbf{a} , \mathbf{b} and λ , for \vec{FE} .

(1)

Given that $AD : AE = 3 : 4$

(d) find and simplify an expression, in terms of \mathbf{a} and \mathbf{b} , for \vec{FE} .

(3)

(e) Hence calculate the value of λ .

(3)



Question 11 continued

A large rectangular area with rounded corners, containing 25 horizontal dotted lines for writing.



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