

Write your name here

Surname

Other names

Edexcel
International GCSE

Centre Number

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Candidate Number

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Mathematics B

Paper 2 



Wednesday 16 May 2012 – Morning

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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PEARSON

3 (a) Calculate the size, in degrees, of an exterior angle of a regular pentagon.

(2)

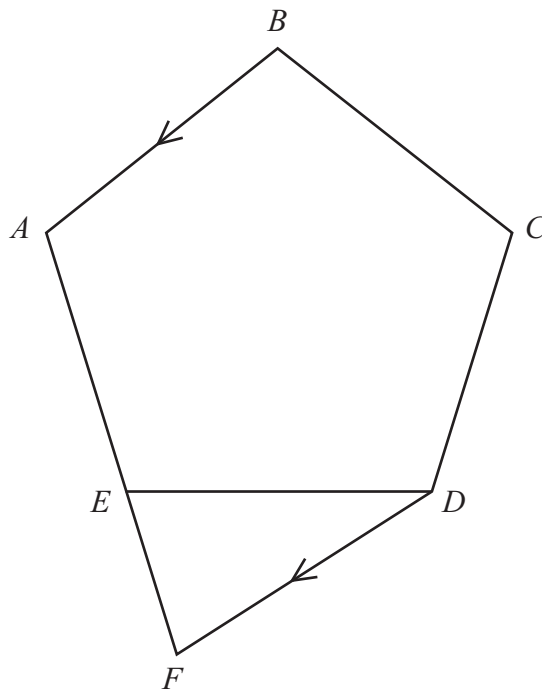


Diagram **NOT**
accurately drawn

Figure 1

In Figure 1, $ABCDE$ is a regular pentagon. AE is extended to the point F such that DF is parallel to BA .

(b) Show, giving reasons, that triangle DEF is isosceles.

(4)



4 One day a cinema showed the following four films

The Taking of Algebra 123

The Binary Knot

Carry On Subtracting

The Long Division

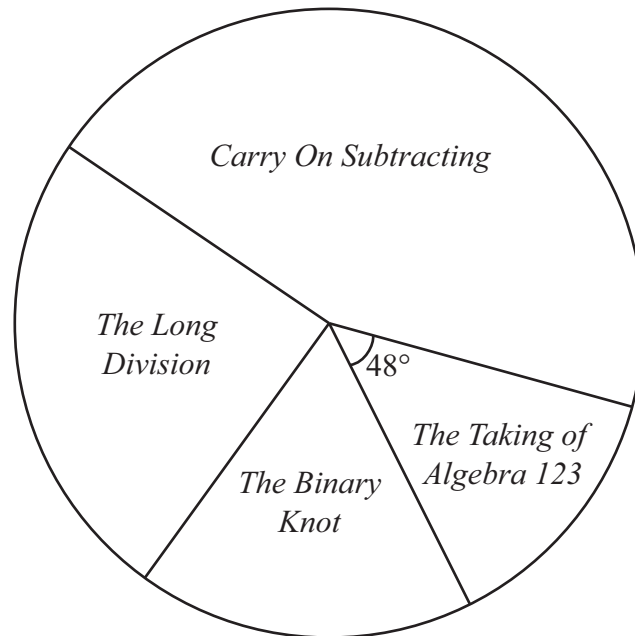


Diagram **NOT**
accurately drawn

Figure 2

The pie chart in Figure 2 shows information about the number of people who watched each film that day.

The angle of the sector for the film *The Taking of Algebra 123* is 48° and 80 people watched this film.

(a) Calculate the total number of people who watched these four films.

(2)

The number of people who watched *The Binary Knot* was 115

(b) Calculate the angle of the sector for this film.

(2)

The ratio of the number of people who watched *Carry on Subtracting* to the number of people who watched *The Long Division* was 2 : 1

(c) Calculate the number people who watched *Carry on Subtracting*.

(2)

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Question 4 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

(Total for Question 4 is 6 marks)



Question 5 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

(Total for Question 5 is 7 marks)



P 4 0 6 6 2 A 0 1 1 3 2

6

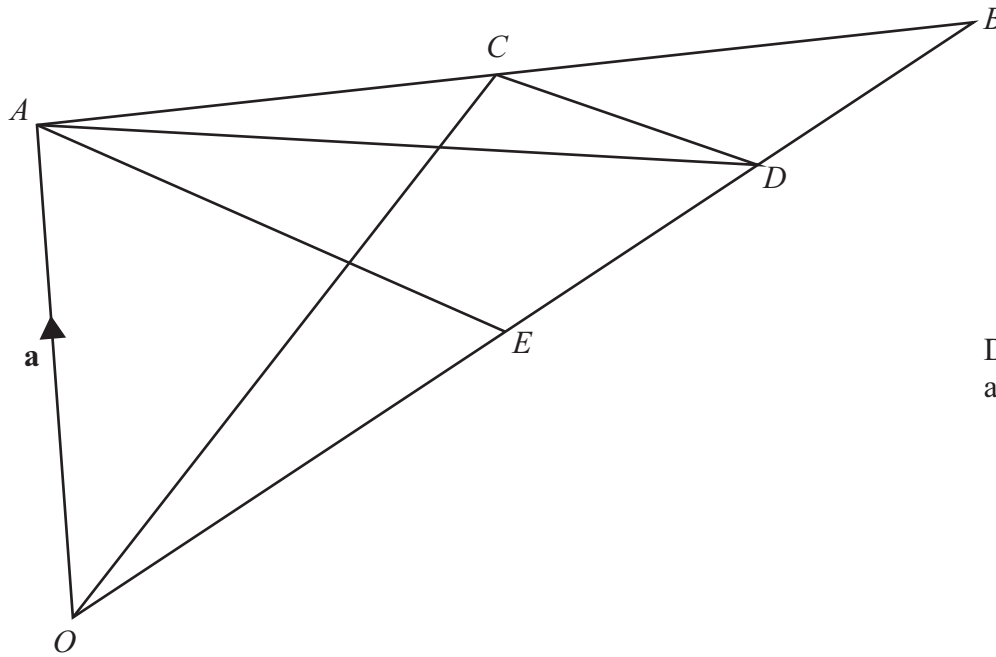
Diagram **NOT**
accurately drawn

Figure 3

In Figure 3, $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.

The point C is the midpoint of AB .

(a) Find, in terms of \mathbf{a} and \mathbf{b} , simplifying your answer

(i) \overrightarrow{AB} ,

(ii) \overrightarrow{OC} .

(3)

The point D is on OB such that $OD : DB = 3 : 1$

(b) Find, in terms of \mathbf{a} and \mathbf{b} , and simplifying your answer, \overrightarrow{CD} .

(3)

The point E is on OB such that $\triangle BCD$ is similar to $\triangle BAE$.

(c) Find, in terms of \mathbf{a} and \mathbf{b} , \overrightarrow{AE} .

(2)

(d) Write down the ratio of $OE : EB$ in the form $m : n$ where m and n are integers.

(1)



Question 6 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

(Total for Question 6 is 9 marks)



P 4 0 6 6 2 A 0 1 3 3 2

8 The points $(1, -1)$, $(4, -2)$ and $(3, -5)$ are the vertices of triangle A .

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

(1)

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

$$\mathbf{N} = \begin{pmatrix} -2 & -1 \\ \frac{3}{2} & \frac{1}{2} \end{pmatrix}$$

(b) Find the coordinates of the vertices of B .

(2)

(c) On the grid, draw and label B .

(1)

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

$$\mathbf{M} = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

(d) Find the coordinates of the vertices of C .

(2)

(e) On the grid, draw and label C .

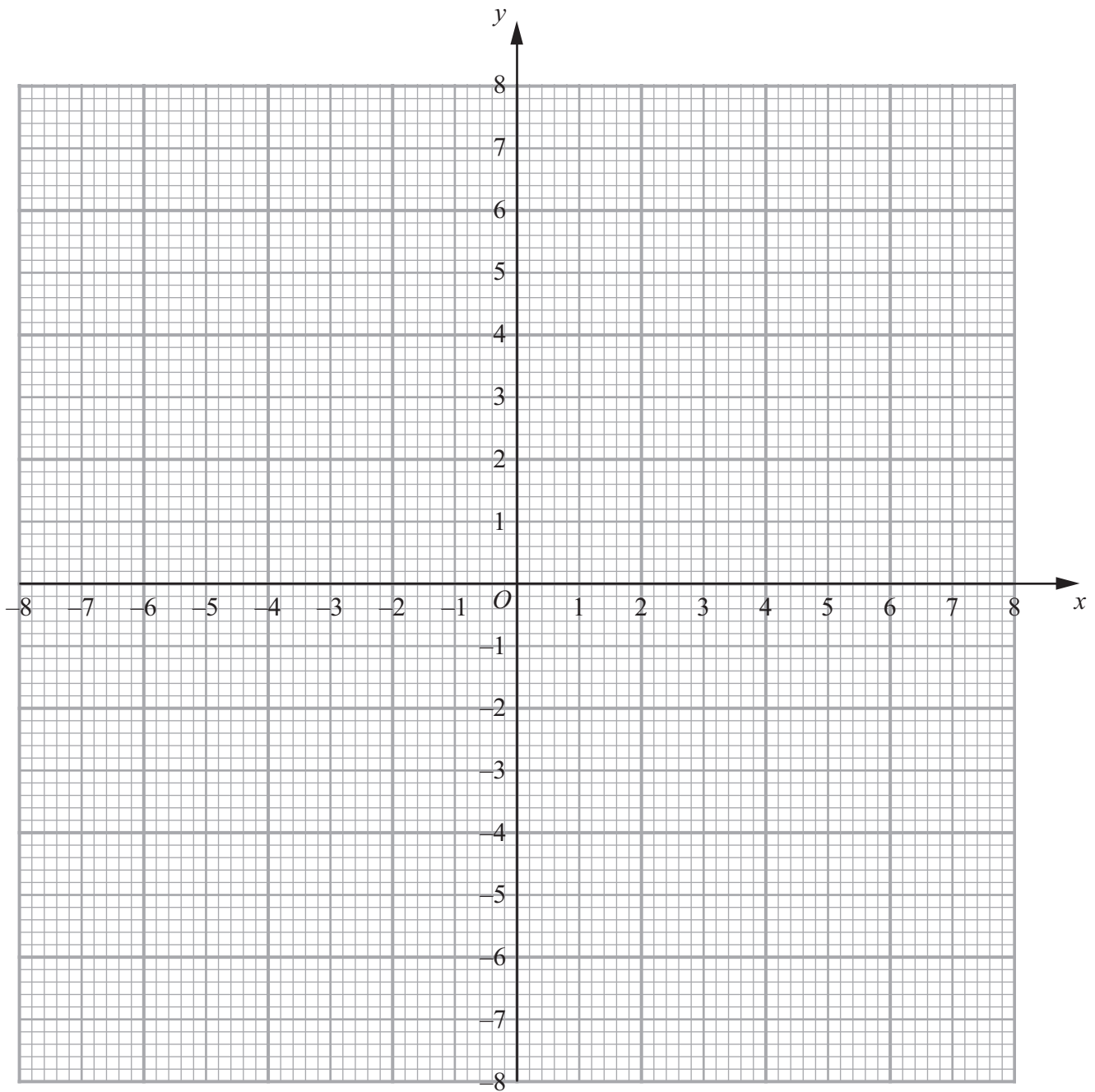
(1)

(f) Describe fully the single transformation which maps triangle C onto triangle A .

(2)



Question 8 continued



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Question 8 continued

A series of horizontal dotted lines for writing.



Question 8 continued

Handwriting practice area consisting of 25 horizontal dotted lines for writing.

(Total for Question 8 is 9 marks)



Question 9 continued

Handwriting practice area with 20 horizontal dotted lines.



Question 9 continued

A series of horizontal dotted lines for writing.



Question 9 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

(Total for Question 9 is 13 marks)



P 4 0 6 6 2 A 0 2 3 3 2

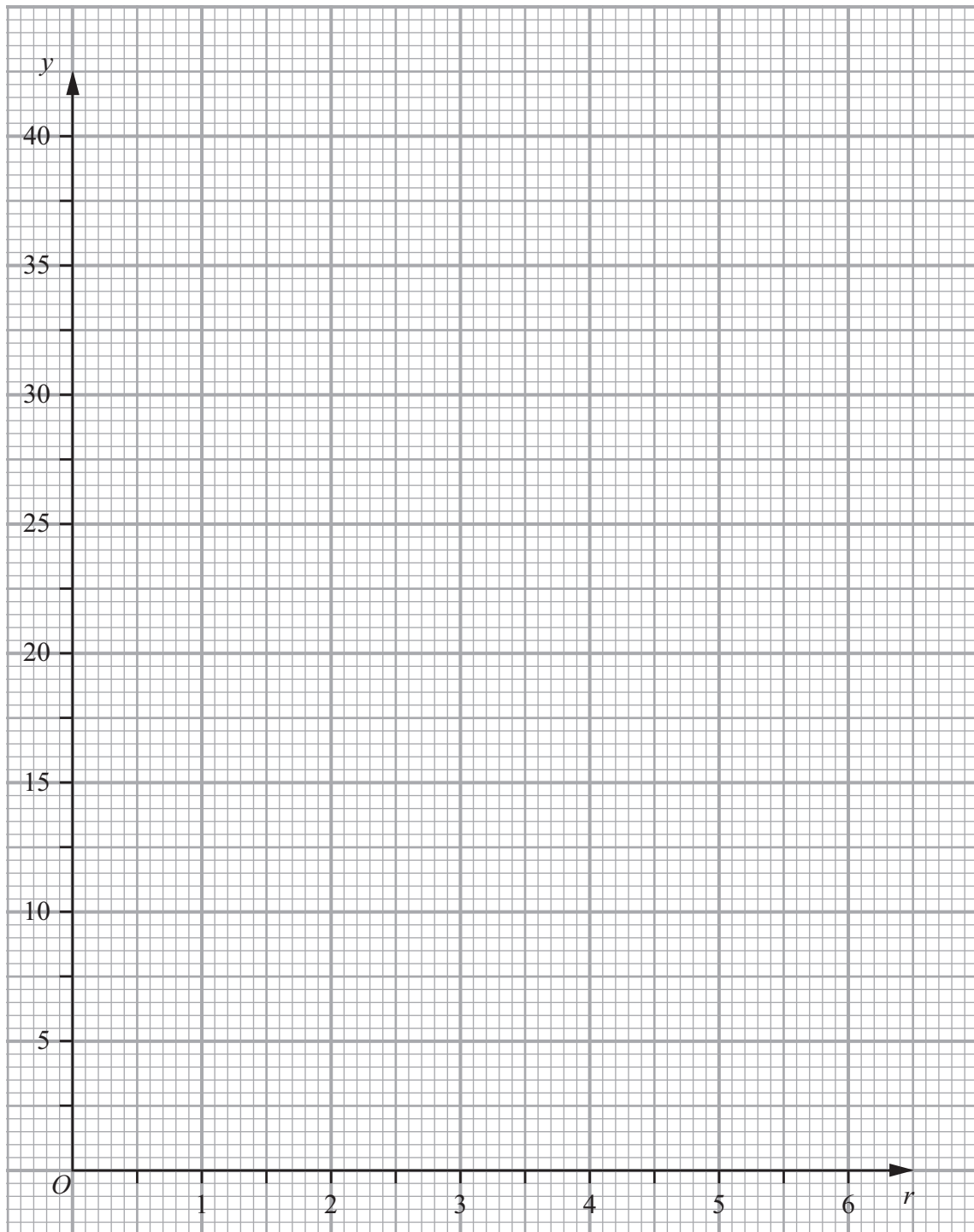
Question 10 continued

A series of horizontal dotted lines for writing.



P 4 0 6 6 2 A 0 2 5 3 2

Question 10 continued



(Total for Question 10 is 16 marks)



11

Diagram NOT
accurately drawn

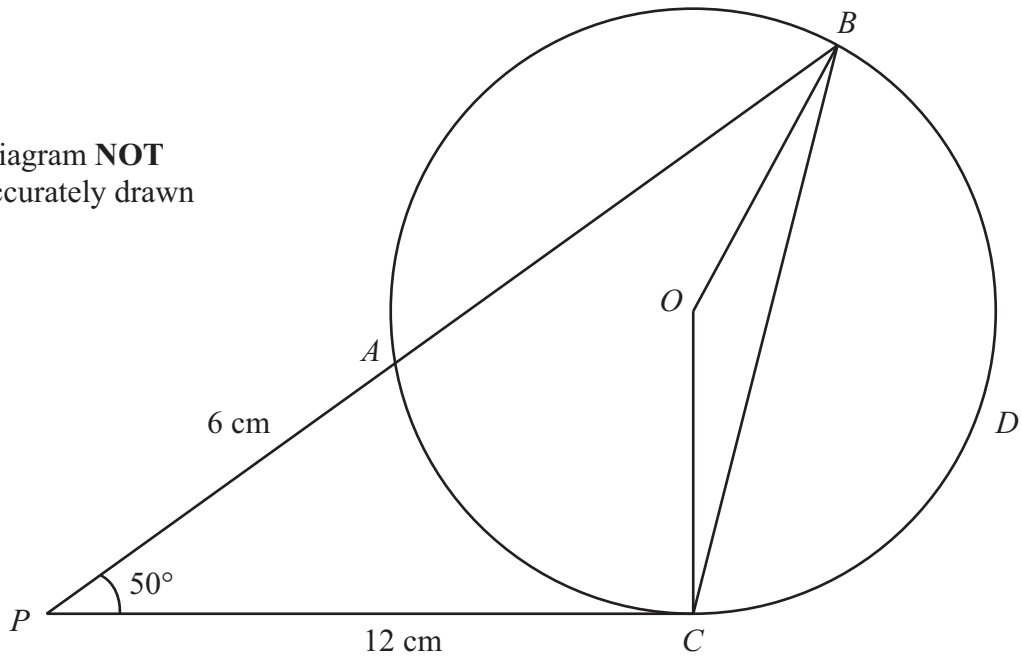


Figure 5

In Figure 5, $ABDC$ is a circle with centre O . The tangent at C meets BA produced at P .

$PA = 6$ cm, $PC = 12$ cm.

(a) Give a reason why $\angle OCP$ is 90° . (1)

(b) Show that $PB = 24$ cm. (2)

Given that $\angle BPC = 50^\circ$ find, giving all your answers to 3 significant figures,

(c) the length, in cm, of BC , (3)

(d) the size, in degrees, of $\angle BCO$, (4)

(e) the radius, in cm, of the circle, (3)

(f) the area, in cm^2 , of the sector $OBDC$. (3)

$$[\text{Cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{Area of circle} = \pi r^2]$$



Question 11 continued

Handwriting practice area consisting of 25 horizontal dotted lines.



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