

Write your name here

Surname	Other names
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**Pearson Edexcel**                      Centre Number                      Candidate Number

**International GCSE**

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# Further Pure Mathematics

## Paper 2

Thursday 23 January 2014 – Morning <b>Time: 2 hours</b>	Paper Reference <b>4PM0/02</b>
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<b>Calculators may be used.</b>	Total Marks
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**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.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*

**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.

*Turn over* ►

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**Question 5 continued**

A large rectangular area containing 25 horizontal dotted lines for writing the answer to Question 5.







**Question 6 continued**

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



**Question 6 continued**

A large rectangular area containing 25 horizontal dotted lines for writing the answer to Question 6.





7

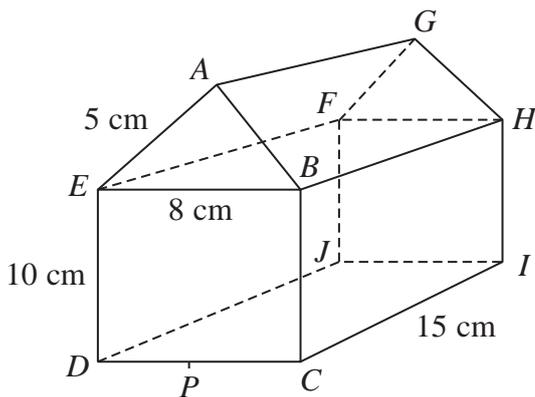


Diagram **NOT** accurately drawn

Figure 3

Figure 3 shows a prism  $ABCDEFGH IJ$  which consists of a triangular prism  $ABEFGH$  on top of a cuboid  $BCDEFHIJ$ .

$$AB = AE = 5 \text{ cm}, \quad EB = 8 \text{ cm}, \quad ED = 10 \text{ cm}, \quad CI = 15 \text{ cm}$$

$P$  is the midpoint of  $DC$ .

Calculate, in cm to 3 significant figures,

(a) the length of  $PG$ , (3)

(b) the length of  $AC$ . (2)

Find, in degrees to the nearest  $0.1^\circ$ ,

(c) the size of the angle between  $PG$  and the plane  $CDJI$ , (3)

(d) the size of the angle between the plane  $AGIC$  and the plane  $CDJI$ . (3)

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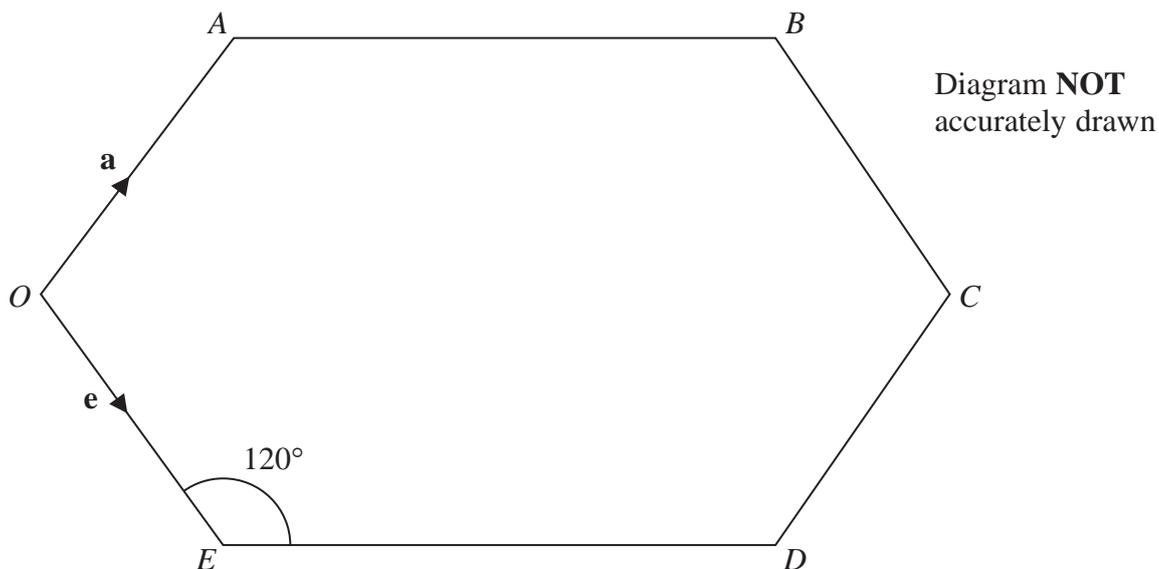
**Question 7 continued**

A large rectangular area containing 25 horizontal dotted lines for writing answers.





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**Figure 4**

Figure 4 shows a hexagon  $OABCDE$ . Each internal angle of the hexagon is  $120^\circ$ .

$$OA = OE, \quad AB = ED = 2 \times OA \quad \text{and} \quad OC = 3 \times OA$$

$$\vec{OA} = \mathbf{a} \quad \text{and} \quad \vec{OE} = \mathbf{e}.$$

Find as simplified expressions in terms of  $\mathbf{a}$  and  $\mathbf{e}$

(a)  $\vec{AB}$ , (2)

(b)  $\vec{BE}$ . (2)

The point  $P$  divides  $AB$  internally in the ratio 2:3

(c) Find  $\vec{PC}$  as a simplified expression in terms of  $\mathbf{a}$  and  $\mathbf{e}$ . (3)

The point  $Q$  lies on  $ED$  produced so that the points  $P$ ,  $C$  and  $Q$  are collinear.

(d) Find  $\vec{OQ}$  in the form  $\lambda\mathbf{a} + \mu\mathbf{e}$ , stating the value of  $\lambda$  and the value of  $\mu$ . (6)

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**Question 8 continued**

A large rectangular area containing 25 horizontal dotted lines for writing the answer to Question 8.











**Question 9 continued**

A series of horizontal dotted lines for writing the answer to Question 9.

**(Total for Question 9 is 15 marks)**











