

Write your name here						
Surname			Other names			
<b>Pearson Edexcel</b>		Centre Number			Candidate Number	
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<b>Further Pure Mathematics</b>						
<b>Paper 2</b>						
Monday 23 January 2017 – Morning				Paper Reference		
<b>Time: 2 hours</b>				<b>4PM0/02</b>		
Calculators 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.
- 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.

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Turn over ►



Pearson



**Question 1 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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

**(Total for Question 1 is 4 marks)**





**Question 2 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

A large rectangular area with horizontal dotted lines for writing.

**(Total for Question 2 is 7 marks)**





**Question 3 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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

**(Total for Question 3 is 5 marks)**





**Question 4 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

A large rectangular area containing numerous horizontal dotted lines for writing.



**Question 4 continued**

Handwritten area with horizontal dotted lines for writing.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

**Question 4 continued**

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

**(Total for Question 4 is 10 marks)**





**Question 5 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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



**Question 5 continued**

Area with horizontal dotted lines for writing answers.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

**Question 5 continued**

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

**(Total for Question 5 is 11 marks)**





**Question 6 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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



**Question 6 continued**

A large rectangular area with horizontal dotted lines for writing.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

**Question 6 continued**

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

**(Total for Question 6 is 13 marks)**





**Question 7 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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



**Question 7 continued**

Area with horizontal dotted lines for writing answers.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

**Question 7 continued**

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

**(Total for Question 7 is 11 marks)**





**Question 8 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

A large rectangular area containing numerous horizontal dotted lines for writing.



**Question 8 continued**

Handwritten area with horizontal dotted lines for writing.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

**Question 8 continued**

A large rectangular area with horizontal dotted lines for writing answers.

**(Total for Question 8 is 11 marks)**



9 The points  $P$  and  $Q$  have coordinates  $(-2, 5)$  and  $(2, -3)$  respectively.

(a) Find an equation for the line  $PQ$ . (2)

The point  $N$  is such that  $PNQ$  is a straight line and  $PN:NQ = 3:1$

The straight line  $l$  passes through  $N$  and is perpendicular to  $PQ$ .

(b) Find

- (i) the coordinates of  $N$ ,
- (ii) an equation for  $l$ .

(5)

The points  $S$  and  $T$  lie on  $l$  and have coordinates  $(3, s)$  and  $(t, -2)$  respectively.

(c) Find

- (i) the value of  $s$ ,
- (ii) the value of  $t$ .

(2)

(d) Find the area of the quadrilateral  $PSQT$ . (4)

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**Question 9 continued**

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DO NOT WRITE IN THIS AREA

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



**Question 9 continued**

A large rectangular area with horizontal dotted lines for writing.

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DO NOT WRITE IN THIS AREA



**Question 9 continued**

DO NOT WRITE IN THIS AREA

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DO NOT WRITE IN THIS AREA

A large rectangular area with horizontal dotted lines for writing, intended for the student's answer to Question 9.

**(Total for Question 9 is 13 marks)**



10

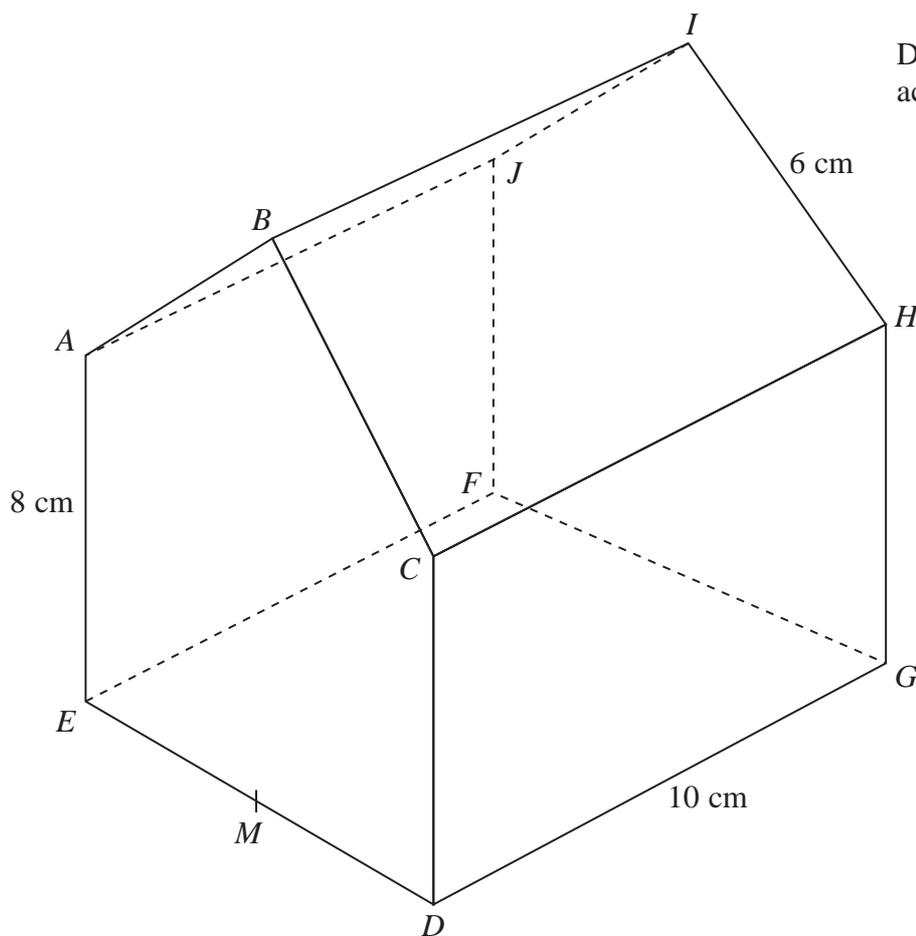


Diagram NOT accurately drawn

Figure 1

Figure 1 shows a right prism  $ABCDEFGHIJ$ . The base,  $DEFG$ , is horizontal and is a rectangle with  $DG = EF = 10$  cm. The midpoint of  $ED$  is  $M$ .

The planes  $ABCDE$  and  $JIHGF$  are vertical.

$$AE = CD = GH = FJ = 8 \text{ cm}$$

$$AB = BC = HI = IJ = 6 \text{ cm}$$

$$\text{Angle } BAC = 30^\circ$$

- (a) Show that the length of  $MD$  is  $3\sqrt{3}$  cm. (2)
  - (b) Show that the length of  $BM$ , the height of the prism, is 11 cm. (2)
  - (c) Find, in cm to 3 significant figures, the length  $BG$ . (3)
- Find, in degrees to 1 decimal place
- (d) the size of the angle between the planes  $BCHI$  and  $CHFE$ , (3)
  - (e) the size of the angle between the planes  $ABIJ$  and  $BEFI$ . (5)

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**Question 10 continued**

DO NOT WRITE IN THIS AREA

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DO NOT WRITE IN THIS AREA

A large rectangular area with a dotted grid pattern, intended for writing the answer to Question 10.



**Question 10 continued**

Area for writing answers, consisting of multiple horizontal dotted lines.

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DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



**Question 10 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

A large rectangular area containing numerous horizontal dotted lines for writing.



**Question 10 continued**

Area with horizontal dotted lines for writing answers.

**(Total for Question 10 is 15 marks)**

**TOTAL FOR PAPER IS 100 MARKS**

DO NOT WRITE IN THIS AREA

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DO NOT WRITE IN THIS AREA

