

Write your name here

Surname

Other names

Edexcel

International GCSE

Centre Number

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Candidate Number

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Further Pure Mathematics

Paper 2

Monday 21 May 2012 – Afternoon

Time: 2 hours

Paper Reference

4PM0/02

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.

Turn over ►

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PEARSON

3 Solve the equations

$$2x^2 + xy - y^2 = 36$$

$$x + 2y = 1$$

(6)

Handwriting practice lines consisting of 20 horizontal dotted lines.



Question 5 continued

A series of horizontal dotted lines for writing.



Question 5 continued

A series of horizontal dotted lines for writing.



Question 8 continued

Ruled area for writing the answer to Question 8.



Question 8 continued

A series of horizontal dotted lines for writing.



Question 8 continued

Ruled area for writing answers, consisting of 25 horizontal dotted lines.

(Total for Question 8 is 9 marks)



Question 9 continued

A series of horizontal dotted lines for writing.



10 The points A, B, C and D are the vertices of a quadrilateral and

$$\vec{AB} = 3\mathbf{i} + 5\mathbf{j}, \quad \vec{AC} = 6\mathbf{i} + 6\mathbf{j} \quad \text{and} \quad \vec{AD} = 9\mathbf{i} + 3\mathbf{j}$$

(a) (i) Find \vec{BC}

(ii) Hence show that $ABCD$ is a trapezium.

(3)

(b) (i) Find the exact value of $|\vec{BD}|$

(ii) Find a unit vector parallel to \vec{BD}

(4)

The point F is on the line BD and $BF : FD = 1 : 2$

(c) Find \vec{AF}

(2)

The point E is on the line AD such that $ABCE$ is a parallelogram.

(d) (i) Show that F lies on the line CE

(ii) Find the ratio $EF : FC$

(6)



Question 10 continued

Handwriting practice area consisting of 20 horizontal dotted lines.



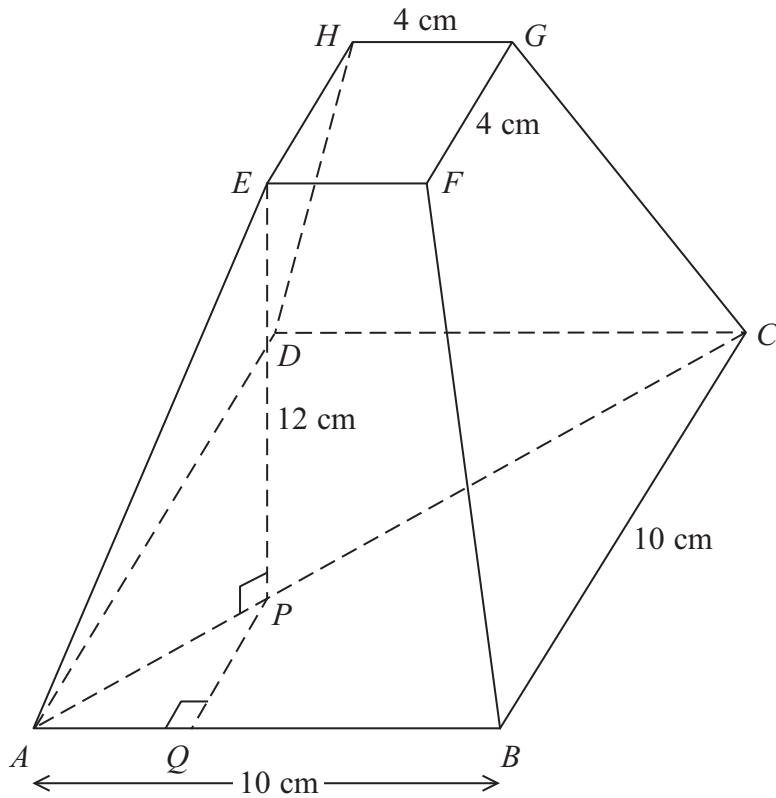


Diagram **NOT** accurately drawn

Figure 1

Figure 1 shows a truncated right pyramid. The base $ABCD$ is a square with sides of length 10 cm. The top $EFGH$ is a square with sides of length 4 cm. The base is parallel to the top and $AE = BF = CG = DH$.

The point P is on the line AC such that angle APE is a right-angle and $EP = 12$ cm.

(a) Find, in centimetres, the exact length of

- (i) AC
- (ii) EG
- (iii) AP

(6)

(b) Find, in centimetres to 3 significant figures, the length of AE .

(2)

(c) Find, in degrees to 1 decimal place, the angle between the line AE and the plane $ABCD$.

(2)

The point Q is on the line AB . Angle AQP is a right-angle.

(d) (i) Show that $PQ = 3$ cm.

(ii) Write down, in centimetres, the length of AQ .

(2)

(e) Find, in degrees to 1 decimal place, the angle between the line AE and the line AB .

(2)

(f) Find, in degrees to 1 decimal place, the angle between the plane $ABFE$ and the plane $ABCD$.

(3)



