

Write your name here

Surname

Other names

**Pearson Edexcel
International GCSE**

Centre Number

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Candidate Number

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Further Pure Mathematics

Paper 1

Tuesday 12 June 2018 – Morning
Time: 2 hours

Paper Reference
4PM0/01

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

Answer all ELEVEN questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1

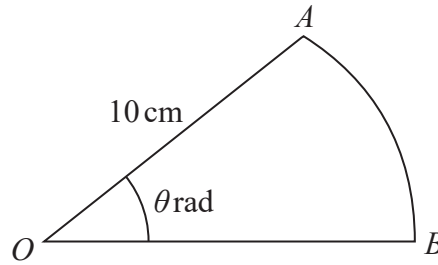


Diagram NOT accurately drawn

Figure 1

Figure 1 shows a sector OAB of a circle. The circle has centre O and radius 10 cm. The area of the sector is 25 cm^2 and angle $AOB = \theta$ radians.

Find

(a) the value of θ , (2)

(b) the length of the arc AB . (2)

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Question 1 continued

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(Total for Question 1 is 4 marks)



2 The equation $3x^2 - 5x + 4 = 0$ has roots α and β .

Without solving this equation, form a quadratic equation with integer coefficients that has roots

$$\alpha + \frac{1}{2\beta} \text{ and } \beta + \frac{1}{2\alpha}$$

(7)



Question 2 continued

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Handwriting practice area consisting of 28 horizontal dotted lines.

(Total for Question 2 is 7 marks)



3 In triangle ABC , $AB = 12$ cm, $BC = 9$ cm and angle $BAC = 42^\circ$

(a) Find, in degrees to the nearest 0.1° , each of the two possible sizes of angle ABC . (5)

(b) Find, to 2 significant figures, the smaller of the two possible areas of triangle ABC . (3)

Area with horizontal dotted lines for writing answers.



Question 3 continued

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(Total for Question 3 is 8 marks)



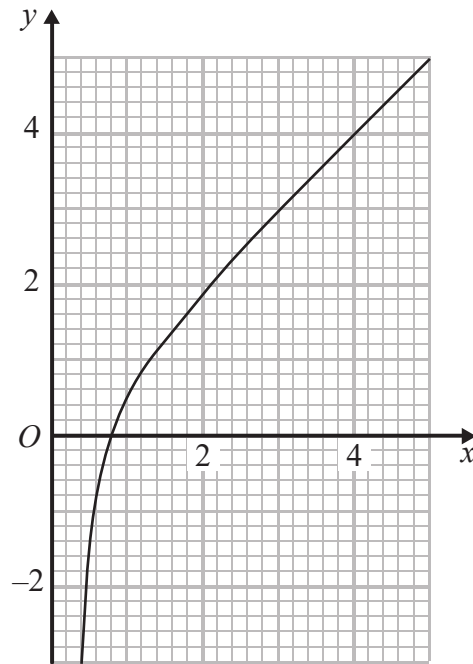


Figure 2

Figure 2 shows the graph of $y = x - \frac{1}{2x^2}$ for $0.4 \leq x \leq 5$ drawn on a grid.

(a) (i) Express $x - \frac{1}{2x^2}$ as a single fraction.

(ii) Hence use the graph to obtain, to one significant figure, an estimate for the value of $\sqrt[3]{0.5}$

(3)

(b) By drawing a suitable straight line on the grid, find an estimate to 2 significant figures, for the root of the equation

$$4 - 2x + \frac{1}{2x^2} = 0$$

in the interval $0.4 \leq x \leq 5$

(3)

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Question 4 continued

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(Total for Question 4 is 6 marks)



Question 5 continued

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(Total for Question 5 is 8 marks)



Question 6 continued

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Question 6 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

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Question 6 continued

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(Total for Question 6 is 7 marks)



Question 7 continued

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Question 7 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

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Question 7 continued

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(Total for Question 7 is 9 marks)



8 The line l has equation $y + 7x = 15$ and the curve C has equation $y = x^2 - 6x + 9$

(a) Use algebra to find the coordinates of the points where l intersects C . (5)

(b) Use algebraic integration to find the exact area of the finite region bounded by l and C . (5)

Area with horizontal dotted lines for writing answers.



Question 8 continued

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Handwriting practice area with 25 horizontal dotted lines.



Question 8 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

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Question 8 continued

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(Total for Question 8 is 10 marks)



Question 9 continued

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Question 9 continued

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Question 9 continued

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(Total for Question 9 is 11 marks)



Question 10 continued

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Question 10 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

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Question 10 continued

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(Total for Question 10 is 16 marks)



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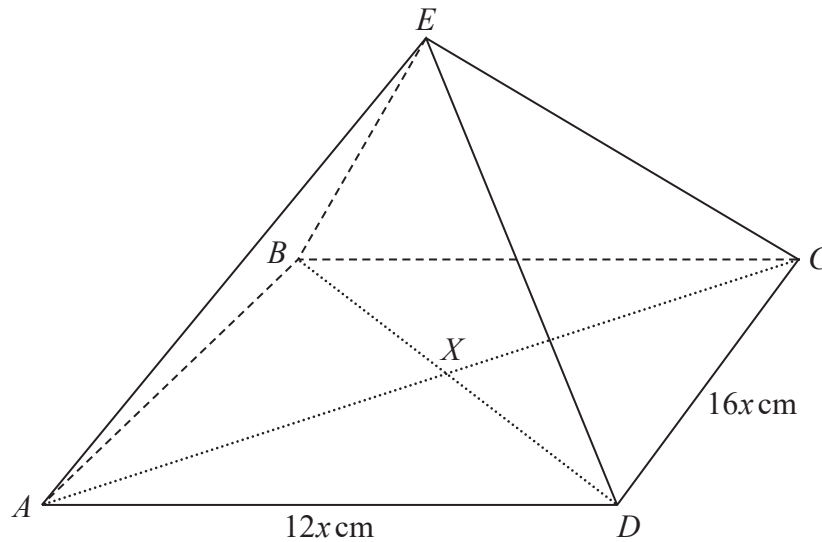


Figure 3

Figure 3 shows the right pyramid $ABCDE$. The base of the pyramid, $ABCD$, is a rectangle with $CD = 16x$ cm and $AD = 12x$ cm. The diagonals of the base intersect at the point X . The edges EA , EB , EC and ED are all of equal length. The size of the angle between EA and the base $ABCD$ is 45°

Find, in terms of x ,

- (a) the height, EX , of the pyramid, (3)
- (b) the length of EA . (2)

Find, in degrees to the nearest 0.1° , the size of

- (c) the acute angle between the planes AEB and $ABCD$, (3)
- (d) the acute angle between the planes BED and AEC . (3)

The area of triangle AED is 250 cm^2

- (e) Find, to 4 significant figures, the value of x . (3)

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Question 11 continued

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Question 11 continued

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Question 11 continued

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