

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

Friday 12 January 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 ►

P53291A

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Pearson

Answer all TEN questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1

$$f(x) = 6 + 5x - 2x^2$$

Given that $f(x)$ can be written in the form $p(x + q)^2 + r$, where p , q and r are rational numbers,

(a) find the value of p , the value of q and the value of r . (3)

(b) Hence, or otherwise, find

- (i) the maximum value of $f(x)$,
- (ii) the value of x for which this maximum occurs. (2)

$$g(x) = 6 + 5x^3 - 2x^6$$

(c) Write down

- (i) the maximum value of $g(x)$,
- (ii) the exact value of x for which this maximum occurs. (3)

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Question 1 continued

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Area with horizontal dotted lines for writing.

(Total for Question 1 is 8 marks)

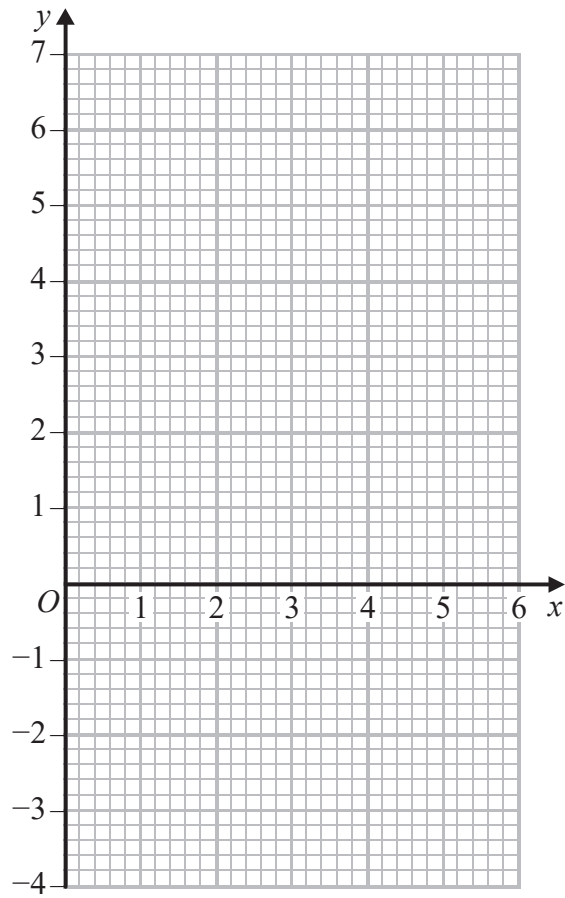


Question 2 continued

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Turn over for a spare grid if you need to redraw your graph



Question 2 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

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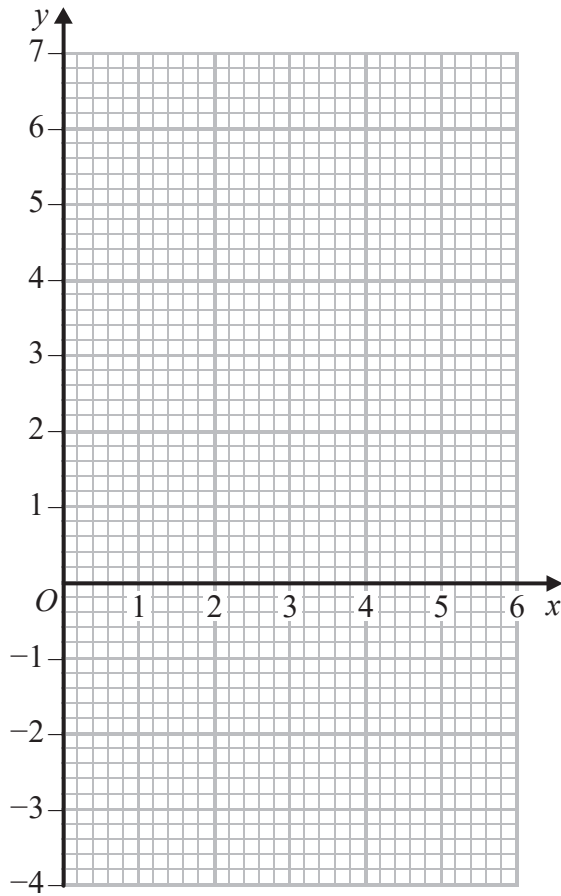
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Question 2 continued

Only use this grid if you need to redraw your graph



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(Total for Question 2 is 8 marks)



- 3 The volume of a right circular cone is increasing at a constant rate of $27 \text{ cm}^3/\text{s}$. The radius of the base of the cone is always 1.5 times the height of the cone.

Calculate the rate of change of the height of the cone, in cm/s to 3 significant figures, when the height of the cone is 4 cm.

(6)

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Question 3 continued

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(Total for Question 3 is 6 marks)



Question 4 continued

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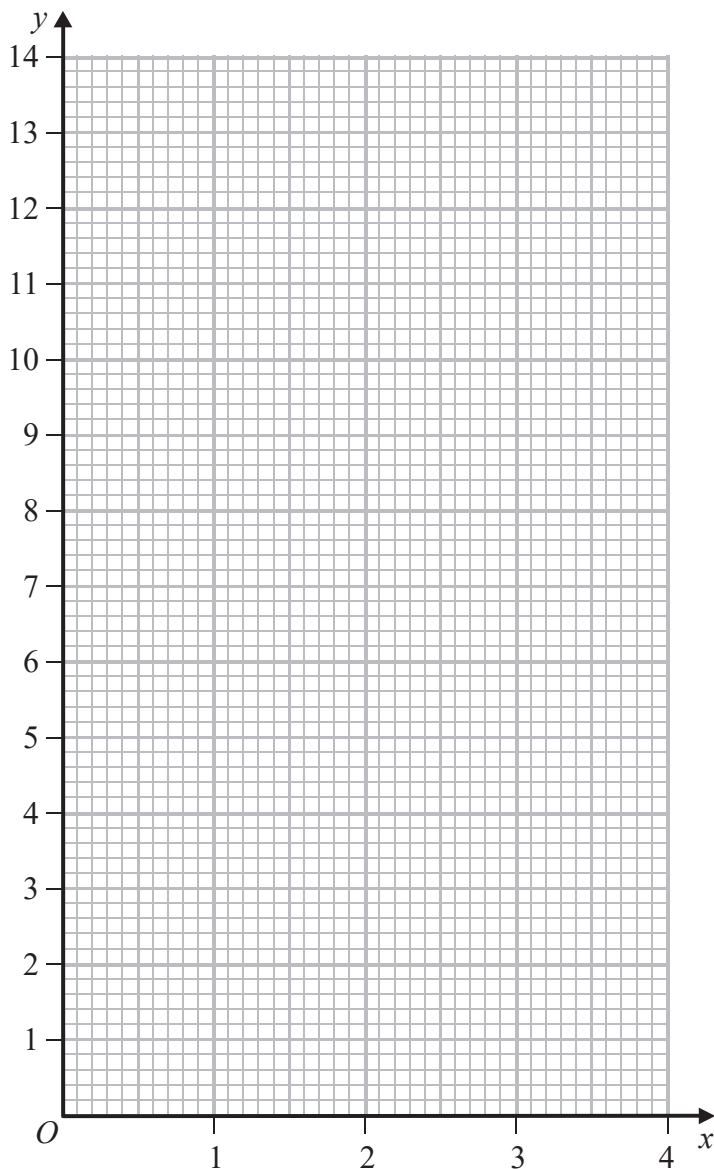
Area with horizontal dotted lines for writing.

(Total for Question 4 is 8 marks)



P 5 3 2 9 1 A 0 1 1 3 6

Question 5 continued



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Turn over for a spare grid if you need to redraw your graph



P 5 3 2 9 1 A 0 1 3 3 6

Question 5 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

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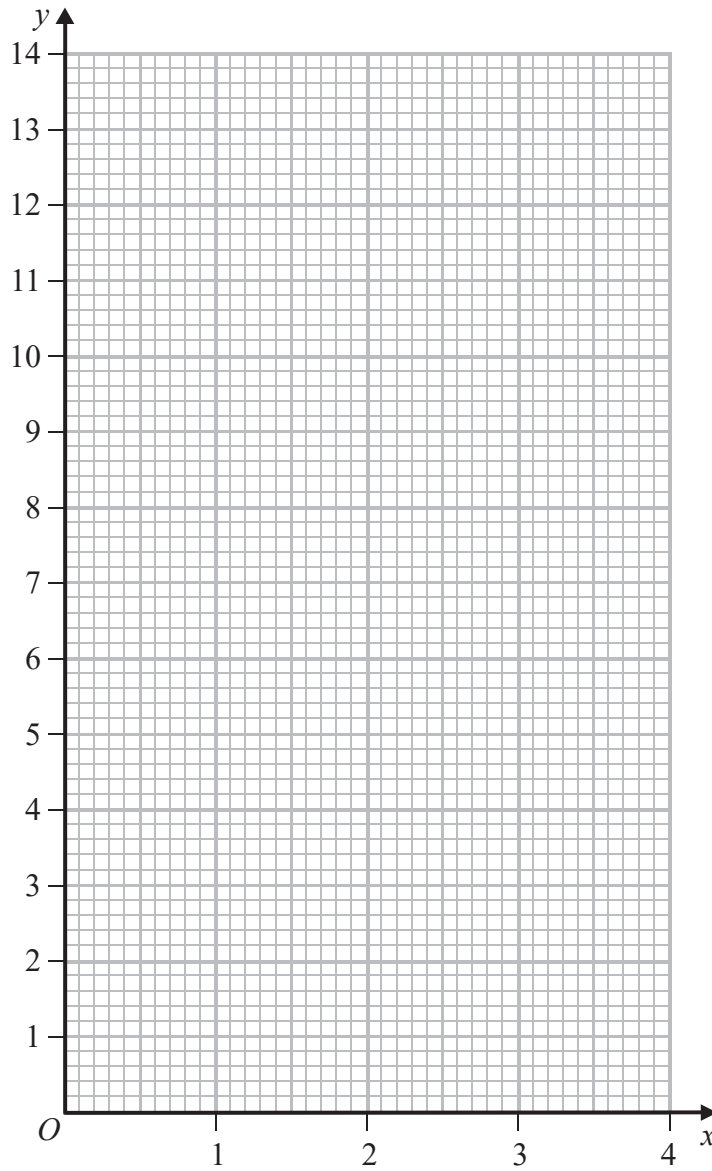
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Question 5 continued

Only use this grid if you need to redraw your graph



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(Total for Question 5 is 9 marks)



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6

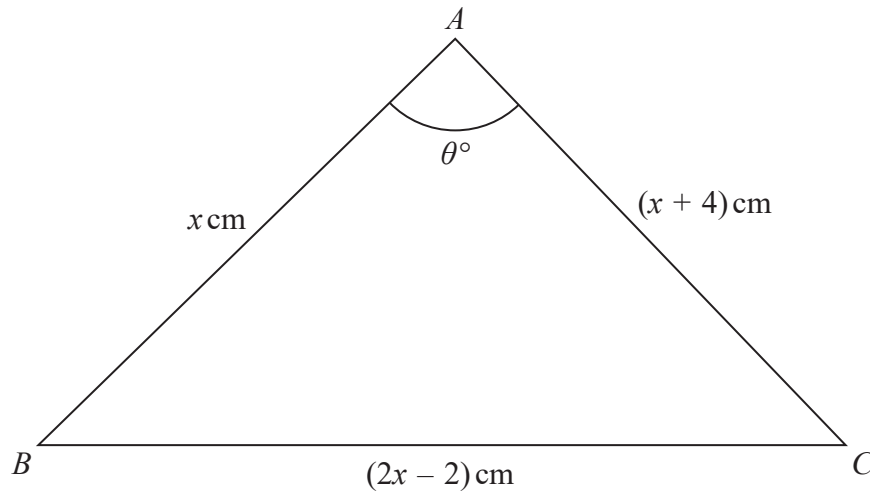


Figure 1

Figure 1 shows the triangle ABC with $AB = x$ cm, $BC = (2x - 2)$ cm, $AC = (x + 4)$ cm and $\angle BAC = \theta^\circ$

Given that $\tan \theta^\circ = \sqrt{255}$ and without finding the value of θ ,

(a) show that $\cos \theta^\circ = \frac{1}{16}$ (2)

Hence find

(b) the value of x , (5)

(c) the size, in degrees to 1 decimal place, of $\angle ABC$, (2)

(d) the area, in cm^2 to 3 significant figures, of triangle ABC . (2)



Question 6 continued

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Handwriting practice area with 25 horizontal dotted lines.



P 5 3 2 9 1 A 0 1 7 3 6

Question 6 continued

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

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Question 6 continued

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Area with horizontal dotted lines for writing.

(Total for Question 6 is 11 marks)



P 5 3 2 9 1 A 0 1 9 3 6

Question 7 continued

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Handwriting practice area with 20 horizontal dotted lines.



P 5 3 2 9 1 A 0 2 1 3 6

Question 7 continued

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

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Question 7 continued

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DO NOT WRITE IN THIS AREA

Area with horizontal dotted lines for writing.

(Total for Question 7 is 11 marks)



P 5 3 2 9 1 A 0 2 3 3 6

Question 8 continued

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Handwriting practice area with 25 horizontal dotted lines.



P 5 3 2 9 1 A 0 2 5 3 6

Question 8 continued

Area with horizontal dotted lines for writing.

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DO NOT WRITE IN THIS AREA



Question 8 continued

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DO NOT WRITE IN THIS AREA

Area with horizontal dotted lines for writing.

(Total for Question 8 is 10 marks)



P 5 3 2 9 1 A 0 2 7 3 6

Question 9 continued

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Handwriting practice area with 25 horizontal dotted lines.



Question 9 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



Question 9 continued

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DO NOT WRITE IN THIS AREA

Area with horizontal dotted lines for writing.

(Total for Question 9 is 13 marks)



P 5 3 2 9 1 A 0 3 1 3 6

Question 10 continued

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DO NOT WRITE IN THIS AREA

Area with horizontal dotted lines for writing.



P 5 3 2 9 1 A 0 3 3 3 6

Question 10 continued

Handwriting practice area consisting of 25 horizontal dotted lines.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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Question 10 continued

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Area with horizontal dotted lines for writing.



P 5 3 2 9 1 A 0 3 5 3 6

Question 10 continued

Area with horizontal dotted lines for writing.

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(Total for Question 10 is 16 marks)

TOTAL FOR PAPER IS 100 MARKS

