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Surname	Other names
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Pearson Edexcel Centre Number Candidate Number

International GCSE

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Further Pure Mathematics

Paper 1

Wednesday 21 May 2014 – Afternoon Time: 2 hours	Paper Reference 4PM0/01
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Calculators may be used.	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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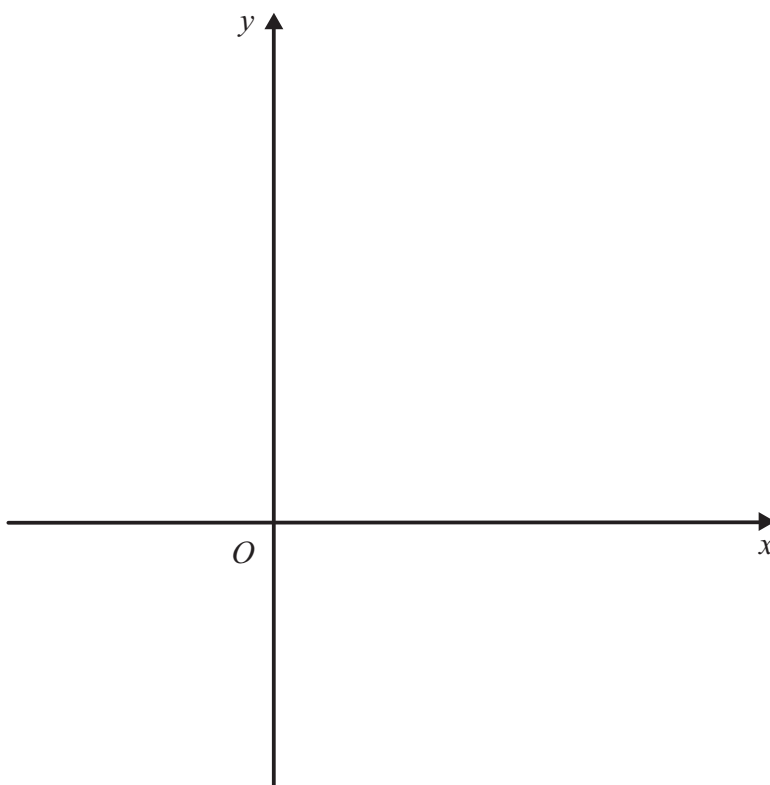


Answer all TEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

- 1 (a) On the axes below, sketch the lines with equations $y = x + 3$ and $y + 2x = 7$
On your sketch mark the coordinates of the points where the lines cross the y -axis. (2)
- (b) Show, by shading on your sketch, the region R defined by the inequalities
 $y \leq x + 3$, $y + 2x \leq 7$, $x \geq 0$ and $y \geq 0$ (1)
- (c) Determine, by calculation, whether or not the point with coordinates $(2, 2)$ lies in R . (2)



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- 5 The volume of a right circular cone is increasing at the rate of $72 \text{ cm}^3/\text{s}$. The height of the cone is always four times the radius of the base of the cone. Find the rate of increase of the radius of the base, in cm/s to 3 significant figures, when the height of the cone is 12 cm.

(6)

(Total for Question 5 is 6 marks)



Question 7 continued

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



8

$$f(x) = 3x^2 + px - 7$$

The equation $f(x) = 0$ has roots α and β .

(a) Without solving the equation

(i) write down the value of $\alpha^2\beta^2$

(ii) find, in terms of p , $\alpha^2 + \beta^2$

(4)

Given that $3\alpha - \beta = 8$

(b) find the possible values of p .

(5)

Given also that p is negative,

(c) form an equation with roots $\frac{1}{\alpha^2}$ and $\frac{1}{\beta^2}$

(3)



9 The points A and B have coordinates $(2, 5)$ and $(16, 12)$ respectively. The point D with coordinates $(8, 8)$ lies on AB .

(a) Find, in the form $p:q$, the ratio in which D divides AB internally. (3)

The line l passes through D and is perpendicular to AB .

(b) Find an equation of l . (4)

The point E with coordinates $(e, 6)$ lies on l .

(c) Find the value of e . (1)

The line ED is produced to F so that $ED = DF$.

(d) Find the coordinates of F . (2)

(e) Find the area of the kite $AEBF$. (3)



Question 9 continued

A large rectangular area containing 25 horizontal dotted lines for writing the answer to Question 9.

10

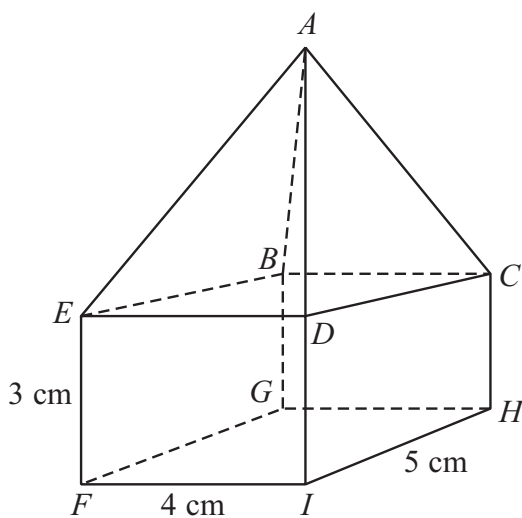


Diagram NOT accurately drawn

Figure 1

A paperweight $ABCDEFGHI$ consists of a cuboid $BCDEFGHI$ and a right pyramid $ABCDE$ as shown in Figure 1.

$$EF = 3 \text{ cm}, \quad FI = 4 \text{ cm}, \quad IH = 5 \text{ cm}$$

The volume of the pyramid is equal to the volume of the cuboid.

(a) Show that the height of the pyramid is 9 cm. (2)

Find, in cm to 3 significant figures, the length of

(b) AE , (3)

(c) EH . (2)

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

(d) the angle between AE and the plane $EBCD$, (3)

(e) the obtuse angle between the plane ABE and the plane $BEIH$. (5)

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