

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel
International GCSE**

Centre Number

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Candidate Number

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Time 1 hour 30 minutes

**Paper
reference**

4MB1/01

**Mathematics B
PAPER 1**



You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper 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.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

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.
- Without sufficient working, correct answers may be awarded no marks.
- Good luck with your examination.

Turn over ►

P66021RA

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P 6 6 0 2 1 R A 0 1 2 8



Pearson

Answer ALL TWENTY NINE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1

ANGLES

Write down all the letters of the above word that have

(a) exactly **one** line of symmetry,

.....
(1)

(b) rotational symmetry of order 2

.....
(1)

(Total for Question 1 is 2 marks)

2 Show that

$$1\frac{1}{3} \times 2\frac{2}{5} = 3\frac{1}{5}$$

Show your working clearly.

(Total for Question 2 is 2 marks)

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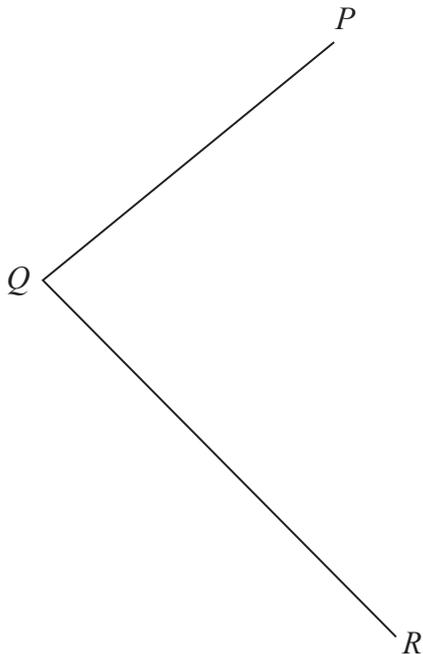
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3 The n th term of a sequence is $3n^2 + 2$

Calculate the sum of the 4th term and the 5th term of the sequence.

.....
(Total for Question 3 is 2 marks)

4 Using ruler and compasses only and **showing all your construction lines**, construct the bisector of angle PQR .



(Total for Question 4 is 2 marks)

- 5 Find the Highest Common Factor (HCF) of 216 and 540
You must show all your working.

.....
(Total for Question 5 is 2 marks)

- 6 Given that $y = 3x^6 - \frac{4}{x^3}$

find $\frac{dy}{dx}$

$\frac{dy}{dx} =$

(Total for Question 6 is 2 marks)

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7

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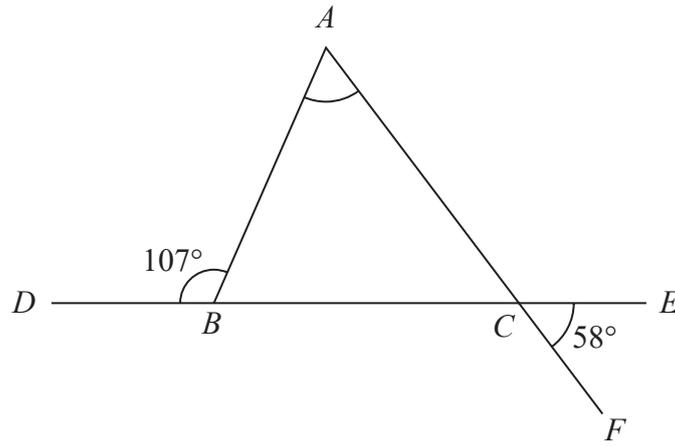


Diagram **NOT** accurately drawn

The diagram shows $\triangle ABC$.

$DBCE$ and ACF are straight lines such that

$$\angle ABD = 107^\circ \text{ and } \angle ECF = 58^\circ$$

Calculate the size, in degrees, of $\angle BAC$.

$$\angle BAC = \dots\dots\dots^\circ$$

(Total for Question 7 is 2 marks)

8 $p, q, 17$ and r are four integers such that $p < q < 17 < r$ and $r = p + 18$

The median of $p, q, 17$ and r is 13

The mean of $p, q, 17$ and r is 15

Find the value of p , the value of q and the value of r .

$p =$

$q =$

$r =$

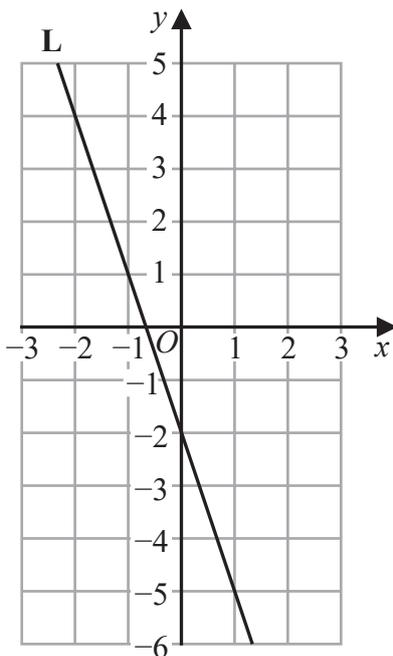
(Total for Question 8 is 3 marks)

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9 The straight line **L** is drawn on the grid.



Find an equation for **L**.

.....
(Total for Question 9 is 3 marks)

10 (a) Write 1.2×10^{-4} as an ordinary number.

.....
(1)

(b) Calculate $\frac{6 \times 10^{144} + 5 \times 10^{142}}{5 \times 10^5}$

Give your answer in standard form.

.....
(2)

(Total for Question 10 is 3 marks)

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11 A triangle has sides of length 8 cm, 10 cm and 15 cm.

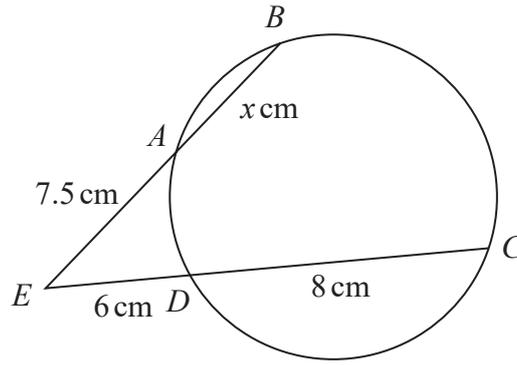
Calculate the size, in degrees to one decimal place, of the smallest angle of the triangle.

o

(Total for Question 11 is 3 marks)



Diagram **NOT** accurately drawn



A, B, C and D are points on a circle.

EAB and EDC are straight lines.

$ED = 6\text{ cm}$ $DC = 8\text{ cm}$ $EA = 7.5\text{ cm}$ $AB = x\text{ cm}$

Calculate the value of x .

$x = \dots\dots\dots$

(Total for Question 12 is 3 marks)

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13 Without using a calculator, and showing all your working, express

$$\frac{\sqrt{75} + \sqrt{243}}{\sqrt{7}}$$

in the form \sqrt{a} where a is a positive integer.
Show your working clearly.

.....
(Total for Question 13 is 3 marks)



14 For all values of x ,

$$15 - 28x - 7x^2 = a + b(x + c)^2$$

where a , b and c are integers.

Find the value of a , the value of b and the value of c .

$a = \dots\dots\dots b = \dots\dots\dots c = \dots\dots\dots$

(Total for Question 14 is 3 marks)

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15 Solve the inequality $6x^2 + 5x - 25 > 0$
Show clear algebraic working.

.....

(Total for Question 15 is 3 marks)

16 (a) Simplify fully $\frac{12x^{12}y^3}{6x^4y}$

.....

(2)

(b) Simplify fully $(2a^5b^3)^4$

.....

(2)

(Total for Question 16 is 4 marks)



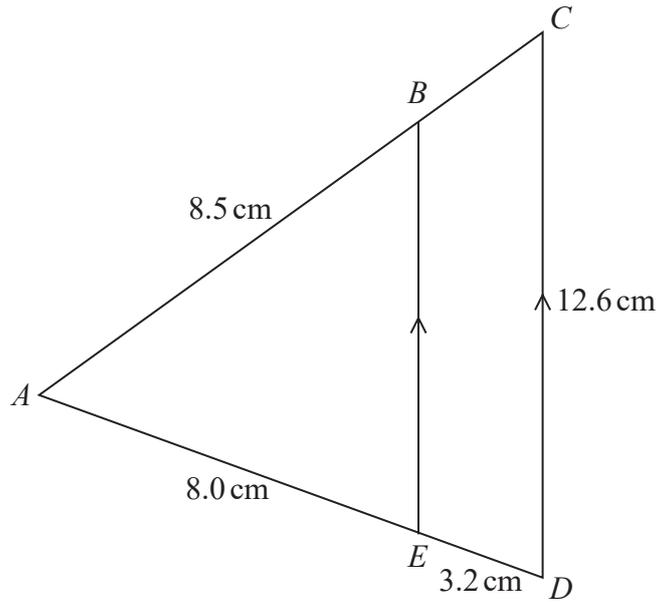


Diagram NOT accurately drawn

In the diagram, ACD is a triangle with point B on AC and point E on AD such that EB is parallel to DC .

$AB = 8.5 \text{ cm}$ $AE = 8.0 \text{ cm}$ $ED = 3.2 \text{ cm}$ $DC = 12.6 \text{ cm}$

(a) Calculate the length of EB .

..... cm
(2)

(b) Calculate the length of AC .

..... cm
(2)

(Total for Question 17 is 4 marks)

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18

$$\mathbf{A} = \begin{pmatrix} 3 & 4 \\ p & 2 \end{pmatrix} \quad \mathbf{B} = \begin{pmatrix} 4 & 2p \\ 2q & -3 \end{pmatrix}$$

Given that $3\mathbf{A} + 2\mathbf{B} = \begin{pmatrix} 17 & 4 \\ -7 & 0 \end{pmatrix}$

find the value of p and the value of q .

$p = \dots\dots\dots$

$q = \dots\dots\dots$

(Total for Question 18 is 4 marks)



19 Solve the simultaneous equations

$$\begin{aligned}3x + 2y &= -1 \\4x - 3y &= -5.3\end{aligned}$$

Show clear algebraic working.

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

(Total for Question 19 is 4 marks)

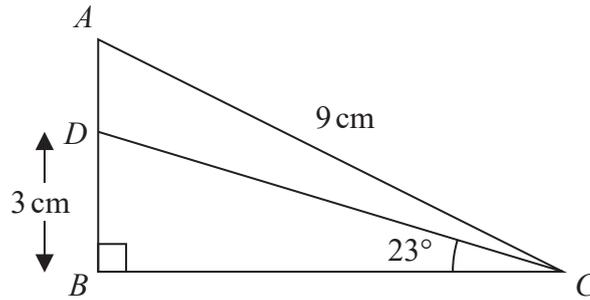
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Diagram **NOT**
accurately drawn



The diagram shows the right angled triangle ABC where $\angle ABC$ is 90° and $AC = 9\text{ cm}$.
The point D lies on AB such that $BD = 3\text{ cm}$ and $\angle BCD = 23^\circ$

Calculate the size, in degrees to one decimal place, of $\angle ACD$.

.....
(Total for Question 20 is 4 marks)



21 Given that $a = -5$

(a) find the value of $\frac{2 - 2a}{3} + 2a^2$

.....
(2)

(b) Write $\frac{\sqrt[3]{c}}{c^2}$ in the form c^x where x is a rational number.

.....
(2)

(Total for Question 21 is 4 marks)

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22 Solid A and solid B are similar.

The table gives information about the surface areas and the volumes of A and B .

	Surface area (in cm^2)	Volume (in cm^3)
Solid A	425	312.5
Solid B	x	67.5

Calculate the value of x .

$x = \dots\dots\dots$

(Total for Question 22 is 4 marks)



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23 Ameer drove from his home to a business meeting.

The distance that Ameer drove was 210 km, to the nearest 10 km.

The time that he took was 3 hours 25 minutes, to the nearest 5 minutes.

Calculate the upper bound, in km/h to one decimal place, of Ameer's average speed as he drove from his home to the business meeting.

..... km/h

(Total for Question 23 is 4 marks)



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24 Express $\left(\frac{3}{2x-4} - \frac{4}{x+2}\right) \div \frac{66-15x}{6x^2-4x-16}$ as a single fraction in its simplest form.

Show clear algebraic working.

.....
(Total for Question 24 is 4 marks)



25 Garcia makes bags from fabric.

Garcia buys a length of fabric that is 40 metres long.

The cost of the fabric is \$5 per metre and he uses all the fabric to make bags.

Each bag that he makes uses a length of 80 cm of the fabric.

Garcia sells $\frac{3}{5}$ of the bags he made for \$14 each bag.

He then reduces the selling price of each bag by 15% and sells the rest of the bags he made.

Calculate the percentage profit that Garcia makes by selling all the bags he made.

..... %

(Total for Question 25 is 5 marks)



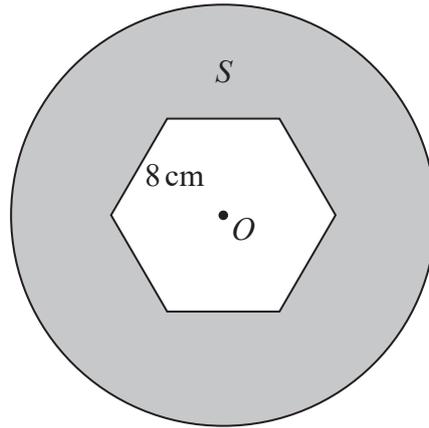


Diagram **NOT**
accurately drawn

The diagram shows a shaded region, S , formed by removing a regular hexagon from a circle.

The centre of the circle is the point O .

The hexagon has centre O and sides of length 8 cm.

Given that

$$\text{area of the hexagon} = \text{area of } S$$

calculate the radius, in cm to one decimal place, of the circle.

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..... cm

(Total for Question 27 is 5 marks)

Turn over for Question 28



- 28 A bag contains n beads.
There are 4 orange beads in the bag.
The rest of the beads are purple.

Donald is going to take at random 2 beads from the bag.

The probability that both beads will be the same colour is $\frac{51}{91}$

Find the value of n .

Show clear algebraic working.

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$n =$

(Total for Question 28 is 6 marks)

Turn over for Question 29



29 A curve has equation $y = x^3 - 4x^2 + 5x + 3$

P and Q are two points on the curve.

P is the point with coordinates $(2, 5)$

The gradient of the tangent to the curve at P is equal to the gradient of the tangent to the curve at Q .

Find the exact coordinates of Q .

(.....,))

(Total for Question 29 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

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