

Please check the examination details below before entering your candidate information

Candidate surname	Other names
Pearson Edexcel	Centre Number
International GCSE	Candidate Number
Tuesday 21 May 2019	
Morning (Time: 1 hour 30 minutes)	Paper Reference 4MB1/01R
Mathematics B	
Paper 1R	
You must have: Ruler graduated in centimetres and millimetres, protractor, 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.

Turn over ►

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Answer ALL TWENTY NINE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** Find the Lowest Common Multiple (LCM) of 60 and 135
Show your working clearly.

.....
(Total for Question 1 is 2 marks)

- 2** The n th term of a sequence is given by $9n - 7$
Determine whether 214 is a term of this sequence.
Show your working clearly.

(Total for Question 2 is 2 marks)

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- 3 Here are four numbers written in order of size.

$$w \quad 7 \quad x \quad 24$$

The range of the four numbers is 18
The median of the four numbers is 10

Find the value of w and the value of x .

$$w = \dots\dots\dots$$

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

(Total for Question 3 is 2 marks)

- 4

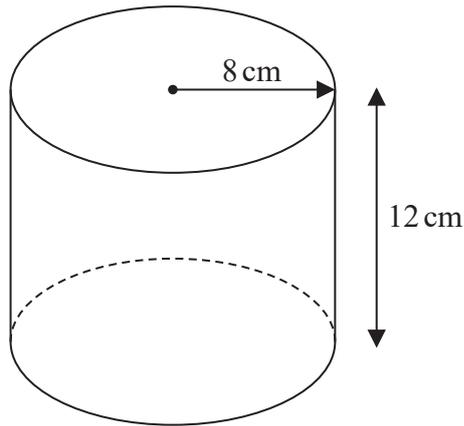


Diagram **NOT**
accurately drawn

The diagram shows a right circular cylinder of radius 8 cm and height 12 cm.

Calculate the volume, in cm^3 to the nearest cm^3 , of the cylinder.

$$\dots\dots\dots \text{cm}^3$$

(Total for Question 4 is 2 marks)



5 Solve $\frac{2x-3}{5} = 9$

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

(Total for Question 5 is 2 marks)

6 $Q = c^2 - 4c$

Work out the value of Q when $c = -6$

$$Q = \dots\dots\dots$$

(Total for Question 6 is 2 marks)

7 Without using a calculator and showing all your working, work out

$$2\frac{3}{4} \div \frac{11}{12}$$

Give your answer in its simplest form.

(Total for Question 7 is 2 marks)

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8

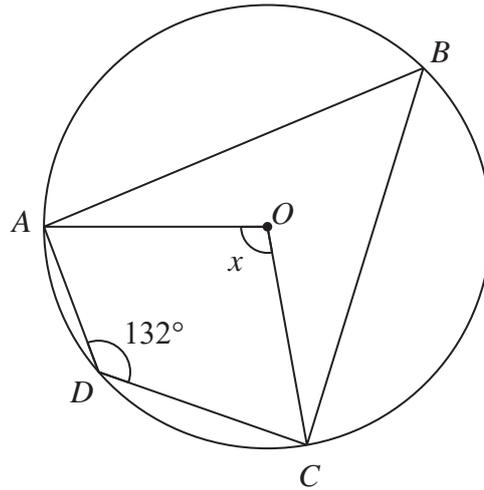


Diagram **NOT**
accurately drawn

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

Angle $ADC = 132^\circ$

Calculate, in degrees, the size of angle x .

.....
(Total for Question 8 is 2 marks)

9 $y = 4x^3 - \frac{7}{x^2}$

Find $\frac{dy}{dx}$

$\frac{dy}{dx} = \dots\dots\dots$

(Total for Question 9 is 2 marks)



10 Given that a is a positive integer, expand and simplify fully

$$\sqrt{5a}(\sqrt{20a} + a\sqrt{5a})$$

(Total for Question 10 is 2 marks)

11

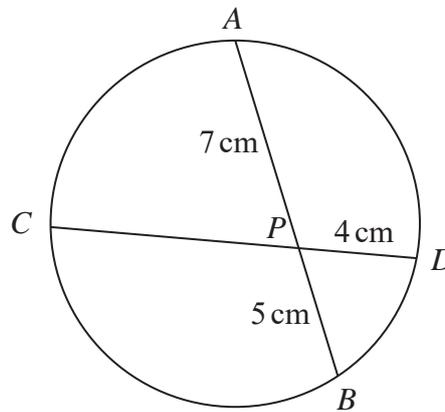


Diagram **NOT** accurately drawn

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

The chord AB intersects the chord CD at P .

$$AP = 7 \text{ cm} \quad PB = 5 \text{ cm} \quad PD = 4 \text{ cm}$$

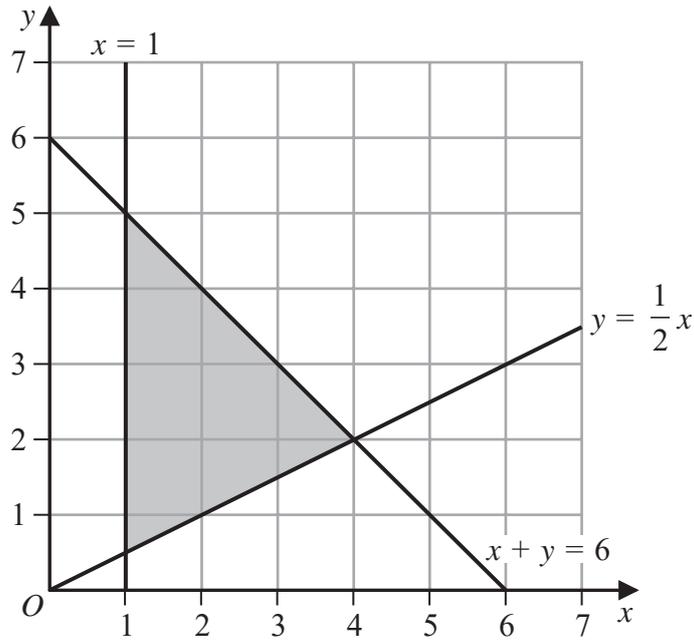
Calculate, in cm, the length of CP .

..... cm

(Total for Question 11 is 2 marks)



12



Write down the three inequalities that define the shaded region in the diagram above.

.....

.....

.....

(Total for Question 12 is 3 marks)

- 13** A motorbike was bought for £8600
 The motorbike depreciated in value by 20% in the first year after it was bought
 and by 15% in each of the following years.

Find the value of the motorbike exactly 3 years after it was bought.

£

(Total for Question 13 is 3 marks)



14

$$\mathbf{A} = \begin{pmatrix} 4 & 3 \\ 2 & -1 \end{pmatrix} \quad \mathbf{B} = \begin{pmatrix} 4 & x \\ 2y & 7 \end{pmatrix}$$

Given that $5\mathbf{A} + n\mathbf{B} = \begin{pmatrix} 8 & 27 \\ 1 & -26 \end{pmatrix}$ where n is an integer,

find the value of n , the value of x and the value of y .

$$n = \dots\dots\dots$$

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

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

(Total for Question 14 is 3 marks)

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15 (a) $x \times 10^5 + y \times 10^3 = k \times 10^5$

Express k in terms of x and y .
Give your answer in its simplest form.

$$k = \dots\dots\dots$$

(2)

(b) Calculate $(8.5 \times 10^{64}) \times (4 \times 10^{68})$
Give your answer in standard form.

$$\dots\dots\dots$$

(2)

(Total for Question 15 is 4 marks)

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16

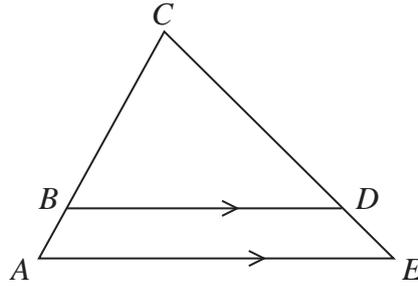


Diagram **NOT**
accurately drawn

The diagram shows triangle ACE .

The point B on CA and the point D on CE are such that BD is parallel to AE .

$BD = 7.2$ cm to 2 significant figures.

$AE = 9.3$ cm to 2 significant figures.

Area of $\triangle BCD = 15.4$ cm² to 3 significant figures.

Calculate the upper bound, to 3 significant figures, for the area of $\triangle ACE$.

..... cm²

(Total for Question 16 is 3 marks)

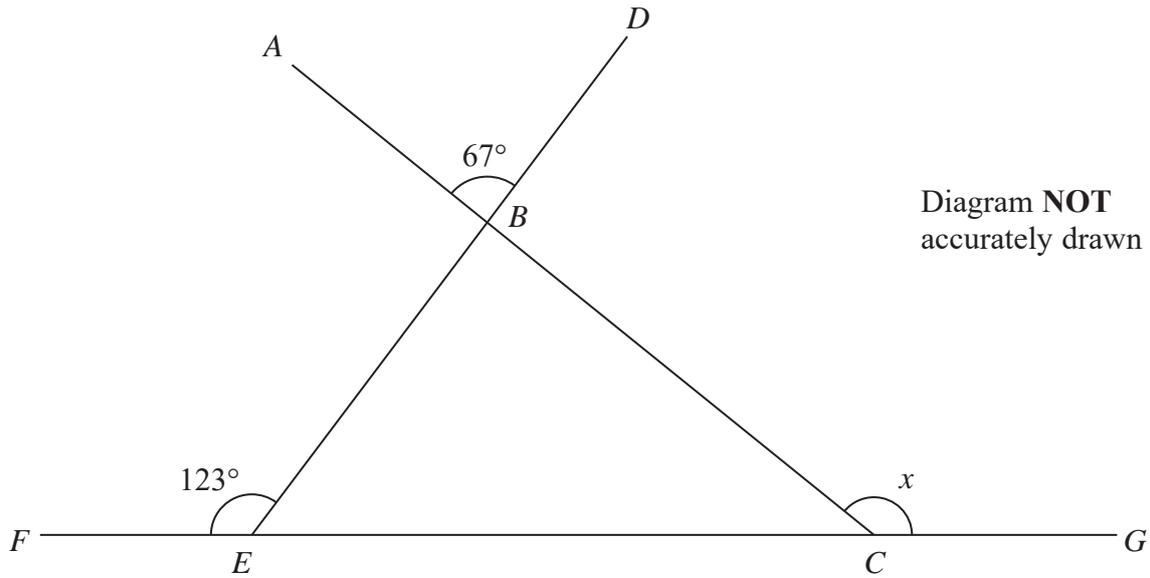
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17

Diagram **NOT**
accurately drawn

The diagram shows three straight lines ABC , DBE and $FECEG$.

$$\angle ABD = 67^\circ \text{ and } \angle BEF = 123^\circ$$

Calculate the size, in degrees, of angle x .

Give a reason for each stage of your working.

(Total for Question 17 is 4 marks)



18 Martin, Jonas and Suzy are three art students.

Martin has x crayons.

Jonas has three times as many crayons as Martin.

Suzy has 7 fewer crayons than Jonas.

These three students have a total of 56 crayons.

(a) Use all this information to write down an equation in x .

.....
(2)

(b) Find the number of crayons Suzy has.

.....
(2)

(Total for Question 18 is 4 marks)

19 The sum of the interior angles of a regular polygon is 2700°

Calculate the size, in degrees to one decimal place, of each interior angle of the regular polygon.

.....
(Total for Question 19 is 3 marks)

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20

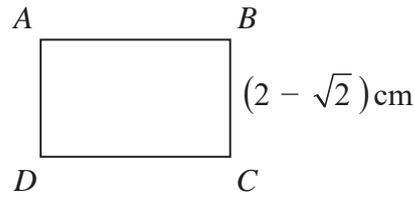


Diagram **NOT**
accurately drawn

The diagram shows rectangle $ABCD$.

$$AD = BC = (2 - \sqrt{2}) \text{ cm}$$

$$\text{Area of } ABCD = 3(5\sqrt{2} - 2) \text{ cm}^2$$

Show that the length of AB can be written in the form $(a + b\sqrt{2})$ cm where a and b are integers to be found.

Show your working clearly.

(Total for Question 20 is 3 marks)



21 Solve the simultaneous equations

$$3x + 4y = 4.5$$

$$2x - 3y = 11.5$$

Show clear algebraic working.

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

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

(Total for Question 21 is 4 marks)

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22

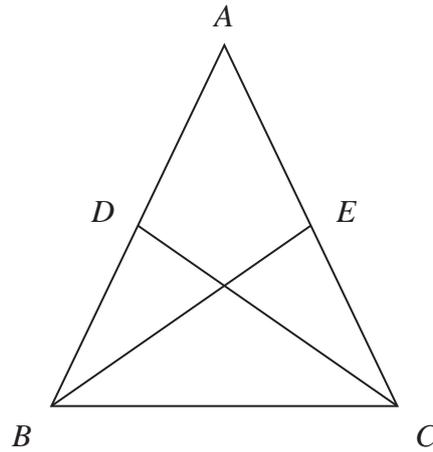


Diagram **NOT**
accurately drawn

ABC is an isosceles triangle with $AB = AC$.

D and E are the midpoints of the sides AB and AC respectively.

Prove that triangles EBC and DCB are congruent.

(Total for Question 22 is 4 marks)



23 Given that $\frac{27^{3x}}{9^y} = 3^{2x} \times 3^{x+1}$

find an expression for y in terms of x .
Give your answer in its simplest form.

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

(Total for Question 23 is 4 marks)

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24 The scale drawing shows the positions of two posts, *A* and *B*.



Scale: 1 cm represents 50 metres

A third post, *C*, is equidistant from *A* and *B*.

- (a) Using ruler and compasses only, construct the locus of points that are equidistant from *A* and *B*. (2)

Given that *C* is also on a bearing of 250° from *B*,

- (b) find and mark the position of *C* on the scale drawing with a cross (\times).
Label the cross *C*. (2)
- (c) Find by measurement from the scale drawing, the distance, in metres to the nearest metre, of *C* from *A*.

..... m
(1)

(Total for Question 24 is 5 marks)



25 The line L_1 has equation $5x + 4y = 16$

The line L_2 is parallel to L_1 and passes through the point with coordinates $(8, 15)$
 L_2 crosses the x -axis at the point A and the y -axis at the point B .

Calculate the length, to the nearest whole number, of AB .

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.....
(Total for Question 25 is 5 marks)



26 (a) Use the factor theorem to show that $(2x - 1)$ is a factor of $6x^3 + 23x^2 - 5x - 4$

(2)

(b) Hence, solve $\frac{6x^3 + 23x^2 - 5x - 4}{2x - 1} = 0$

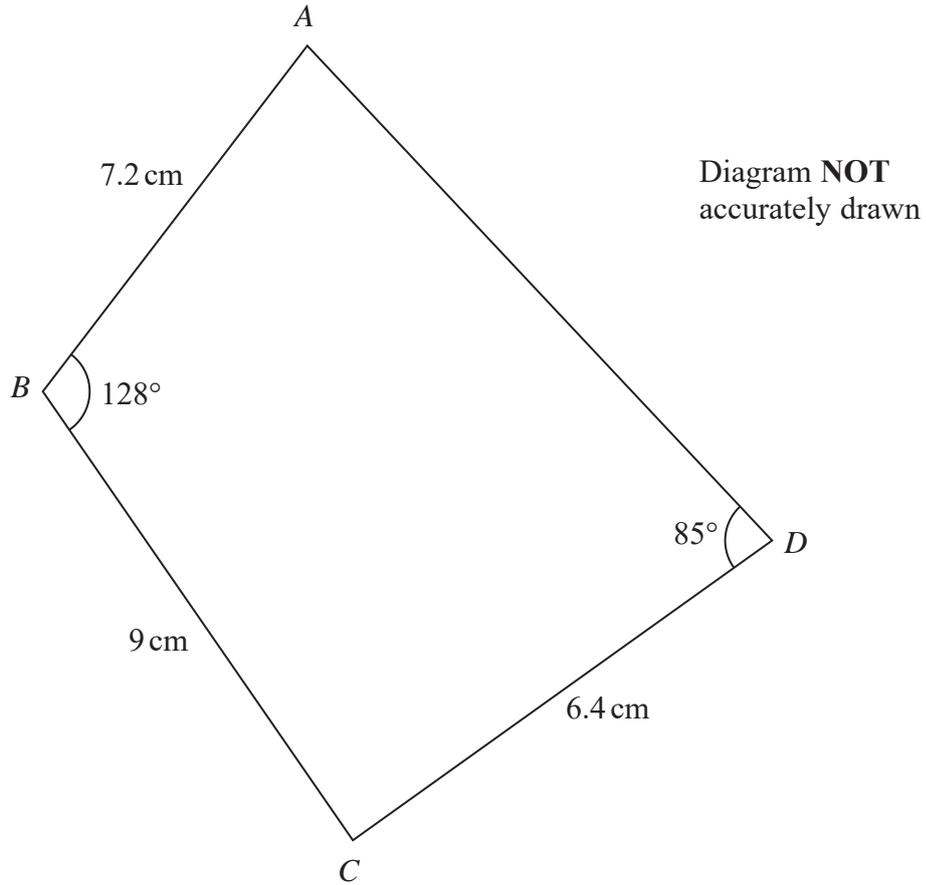
Show clear algebraic working.

.....
(4)

(Total for Question 26 is 6 marks)



27 The diagram shows quadrilateral $ABCD$.



$$AB = 7.2\text{ cm} \quad BC = 9\text{ cm} \quad CD = 6.4\text{ cm}$$

$$\angle ABC = 128^\circ \quad \angle ADC = 85^\circ$$

Calculate the area, in cm^2 to 3 significant figures, of quadrilateral $ABCD$.

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..... cm²

(Total for Question 27 is 6 marks)



- 28 The table below gives information about the lengths of time, in minutes, that 75 cars were parked in a car park on Sunday.

Time (t minutes)	Frequency
$0 < t \leq 5$	8
$5 < t \leq 20$	10
$20 < t \leq 30$	15
$30 < t \leq 40$	17
$40 < t \leq 60$	25

- (a) Calculate an estimate for the mean length of time, in minutes to one decimal place, that the 75 cars were parked in the car park on Sunday.

..... minutes
(4)

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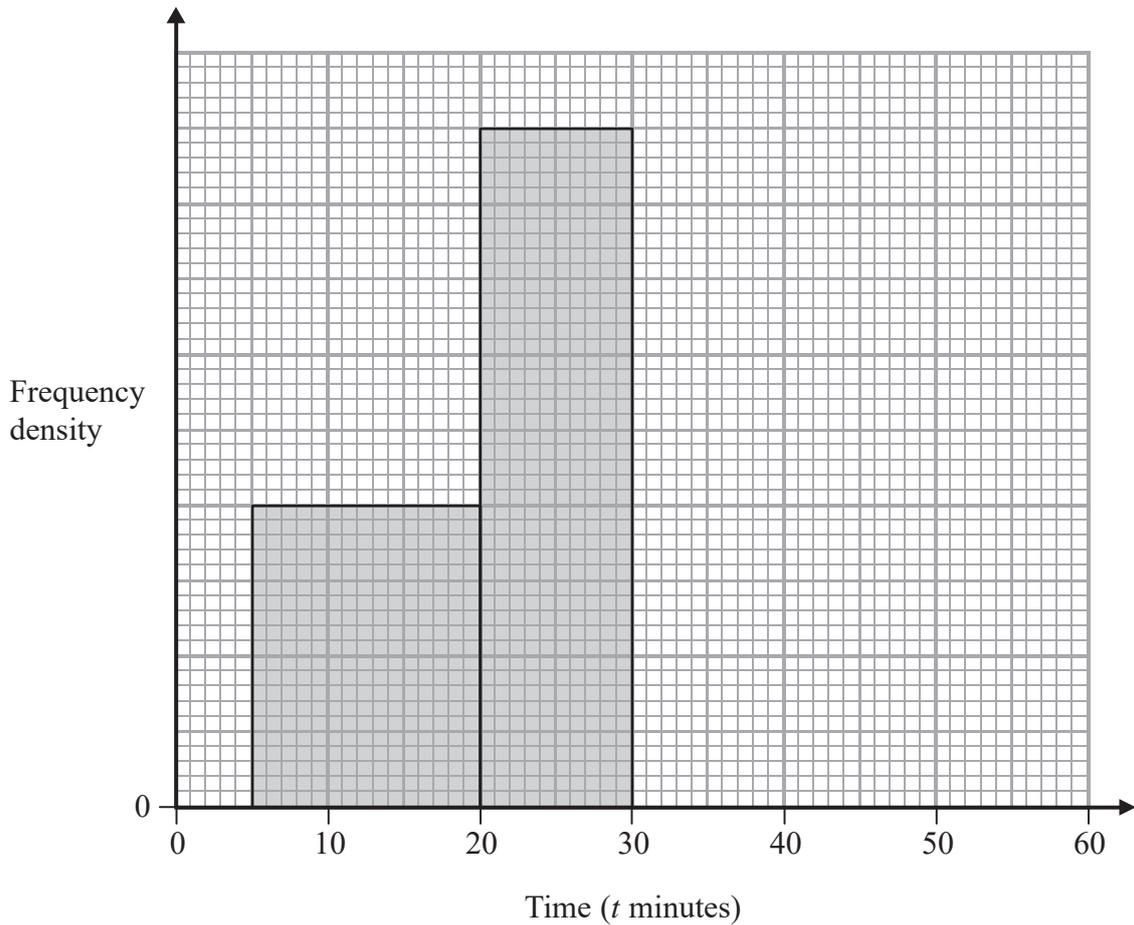
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The incomplete table and incomplete histogram give information about the lengths of time, in minutes, that 132 cars were parked in the car park on Monday.

Time (t minutes)	Frequency
$0 < t \leq 5$	12
$5 < t \leq 20$	
$20 < t \leq 30$	
$30 < t \leq 40$	27
$40 < t \leq 60$	18

(b) Complete the histogram and the table.



(4)

(Total for Question 28 is 8 marks)



29 Given that P is inversely proportional to the square of w and that $P = 16$ when $w = 5$

(a) find the value of P when $w = 12.5$

$$P = \dots\dots\dots (3)$$

Given also that P is inversely proportional to y and that $P = 75$ when $y = 4$

(b) find the value of y when $w = 2$

$$y = \dots\dots\dots (3)$$

(Total for Question 29 is 6 marks)

(TOTAL FOR PAPER IS 100 MARKS)

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