Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | | | | | |

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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1/1/1/1/1/

P 6 0 1 9 2 A 0 1 2 4

Pearson

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 nth 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)

3 Here are four numbers written in order of size.

w 7 x 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.

$w =$ .....

$x =$ .....

(Total for Question 3 is 2 marks)

4

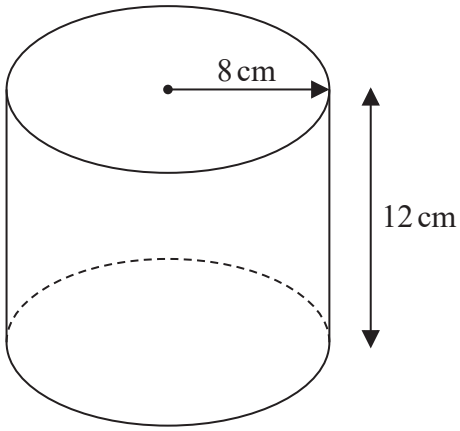


Diagram **NOT** accurately drawn

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.

..... cm^3

(Total for Question 4 is 2 marks)

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

$x =$ .....

(Total for Question 5 is 2 marks)

6 $Q = c^2 - 4c$

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

$Q =$ .....

(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)

8

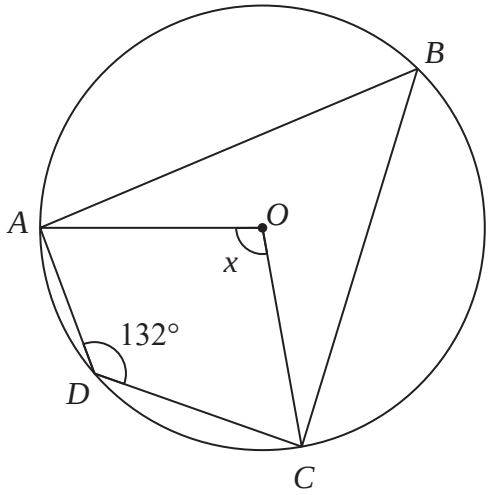


Diagram **NOT** accurately drawn

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

Angle *ADC* = 132°

Calculate, in degrees, the size of angle *x*.

.....°

(Total for Question 8 is 2 marks)

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

Find $\frac{dy}{dx}$

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

(Total for Question 9 is 2 marks)

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

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

.....

(Total for Question 10 is 2 marks)

11

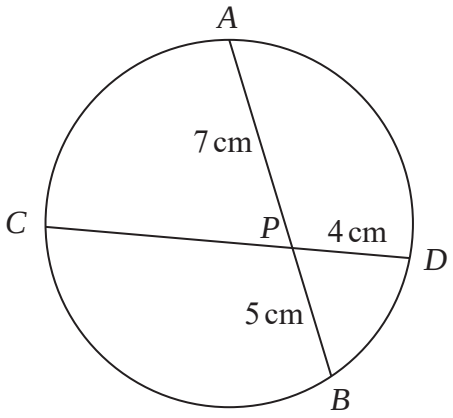


Diagram **NOT** accurately drawn

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

The chord AB intersects the chord CD at P.

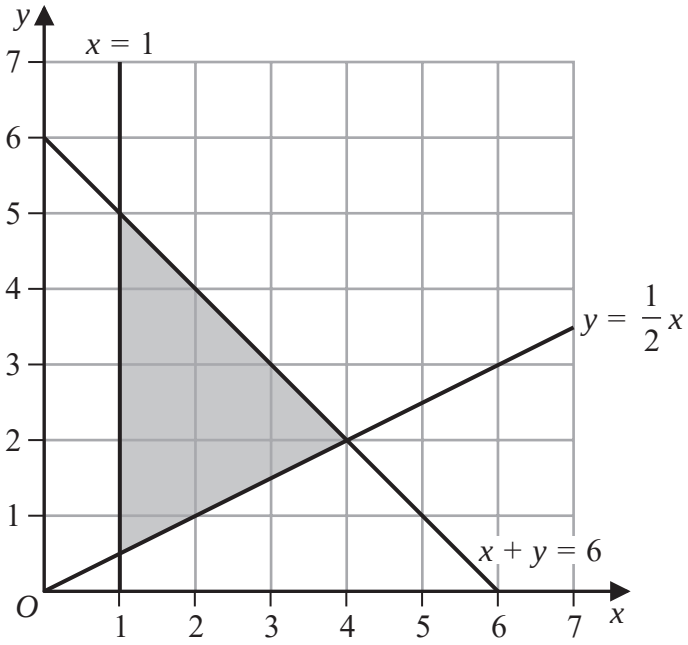
$AP = 7\,\text{cm}$ $PB = 5\,\text{cm}$ $PD = 4\,\text{cm}$

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.

$n =$ .....

$x =$ .....

$y =$ .....

(Total for Question 14 is 3 marks)

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.

$k =$ .....

(2)

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

.....

(2)

(Total for Question 15 is 4 marks)

16

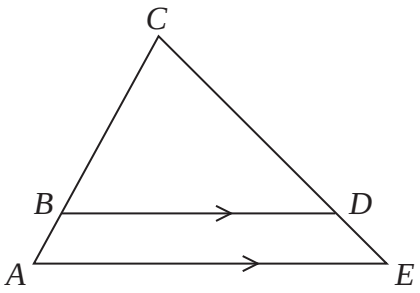


Diagram **NOT** accurately drawn

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 $\triangle BCD = 15.4\,\text{cm}^2$ to 3 significant figures.

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

..... cm^2

(Total for Question 16 is 3 marks)

17

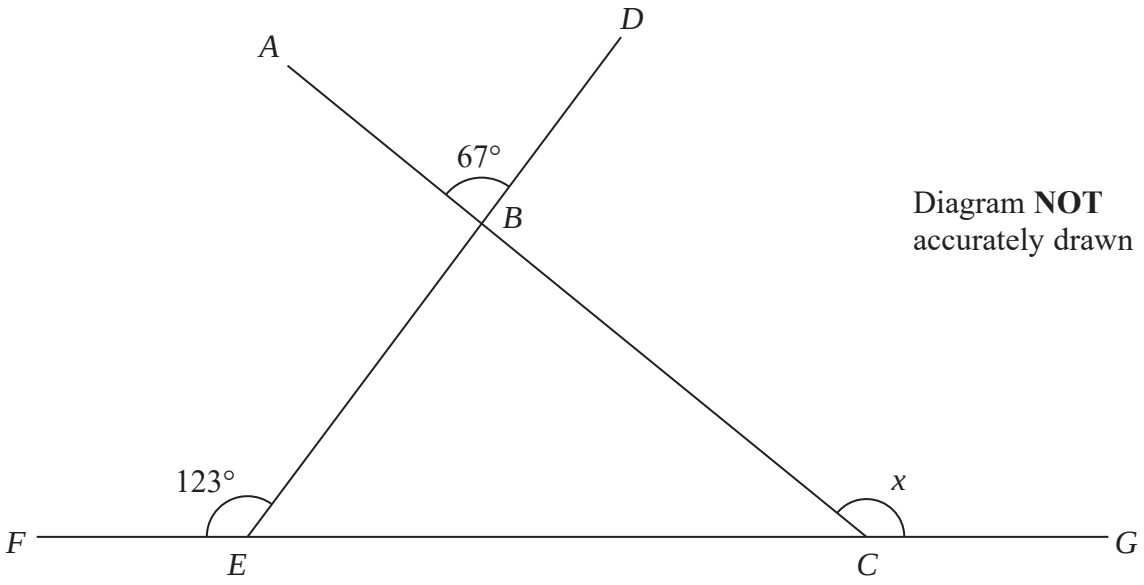


Diagram **NOT** accurately drawn

The diagram shows three straight lines *ABC*, *DBE* and *FECG*.

$\angle ABD = 67°$ and $\angle BEF = 123°$

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)

20

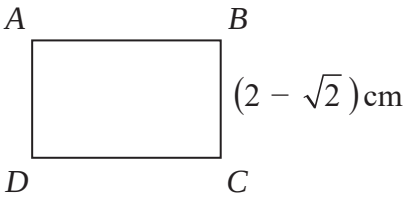


Diagram **NOT** accurately drawn

The diagram shows rectangle *ABCD*.

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

Area of $ABCD = 3(5\sqrt{2} - 2)$ 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.

$x =$ .....

$y =$ .....

(Total for Question 21 is 4 marks)

22

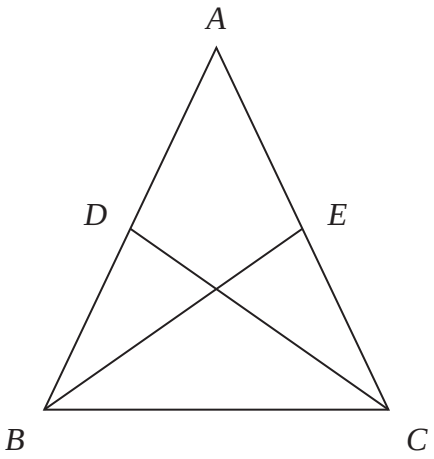


Diagram **NOT** accurately drawn

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.

$y =$ .....

(Total for Question 23 is 4 marks)

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 (×). 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 $\mathbf{L}_1$ has equation $5x + 4y = 16$

The line $\mathbf{L}_2$ is parallel to $\mathbf{L}_1$ and passes through the point with coordinates (8, 15)
$\mathbf{L}_2$ 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.

.....

(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 $\dfrac{6x^3 + 23x^2 - 5x - 4}{2x - 1} = 0$

Show clear algebraic working.

(4)

(Total for Question 26 is 6 marks)

27 The diagram shows quadrilateral *ABCD*.

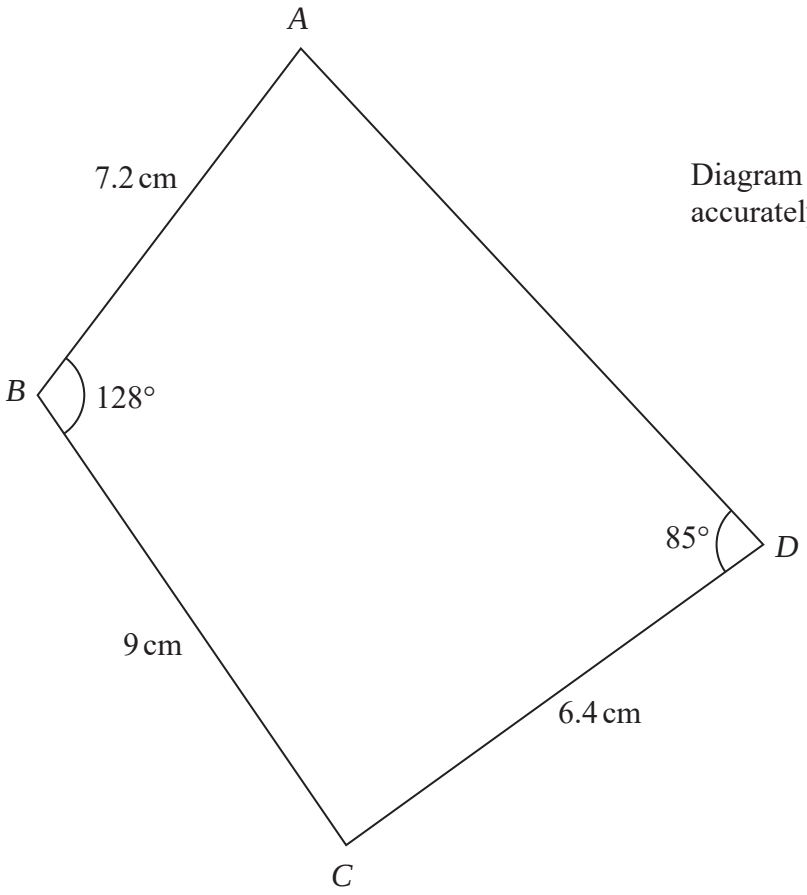


Diagram **NOT** accurately drawn

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

$\angle ABC = 128°$ $\angle ADC = 85°$

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

..... cm^2

(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
$0 < t \leqslant 5$	8
$5 < t \leqslant 20$	10
$20 < t \leqslant 30$	15
$30 < t \leqslant 40$	17
$40 < t \leqslant 60$	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.

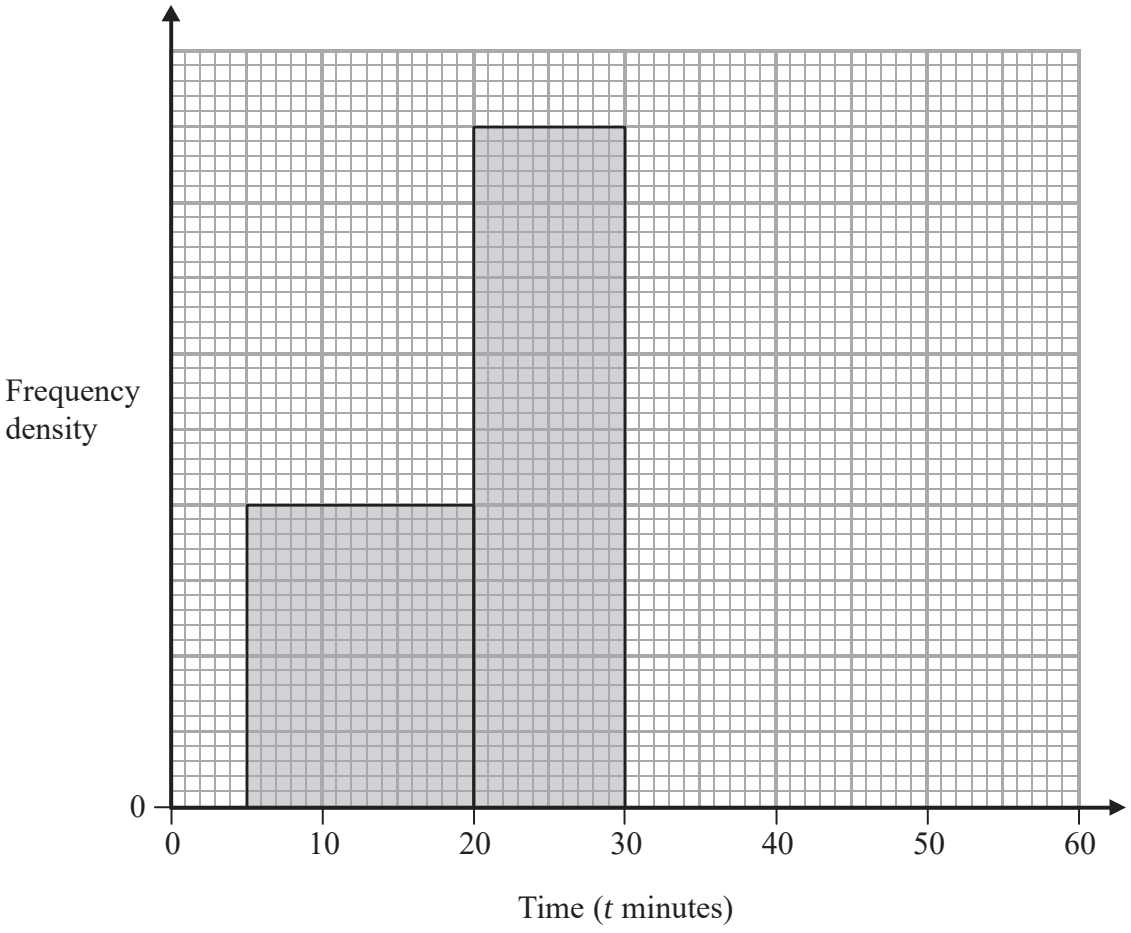
..... minutes

(4)

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
$0 < t \leqslant 5$	12
$5 < t \leqslant 20$	
$20 < t \leqslant 30$	
$30 < t \leqslant 40$	27
$40 < t \leqslant 60$	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 $w = 12.5$

$P =$ .....

(3)

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

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

$y =$ .....

(3)

(Total for Question 29 is 6 marks)

(TOTAL FOR PAPER IS 100 MARKS)