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Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International GCSE

Time 1 hour 30 minutes

Paper reference **4MB1/01R**

Mathematics B
PAPER 1R



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.

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 Without using a calculator and showing all your working, evaluate

$$3\frac{3}{4} \div \frac{5}{8}$$

Give your answer in its simplest form.

.....

(Total for Question 1 is 2 marks)

2 The nth term of a sequence is given by $\frac{n^2 + 3}{2}$

Determine whether 222 is a term of this sequence.
Show your working clearly.

(Total for Question 2 is 2 marks)

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3 Express 450 millilitres as a fraction of 3 litres.
Give your answer in its simplest form.

.....

(Total for Question 3 is 2 marks)

4 All the people at a meeting were asked where they had been for their last holiday.
All the people gave one answer.

Elton recorded the continent of each person's answer.
Elton drew an accurate pie chart for his results.

Elton's results showed that 40 people had been to Europe for their last holiday.
The angle in the pie chart for Europe is 64°

Calculate the number of people at the meeting.

.....

(Total for Question 4 is 2 marks)

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5 The bearing of P from Q is 063°

Calculate the bearing of Q from P

.....°

(Total for Question 5 is 2 marks)

6

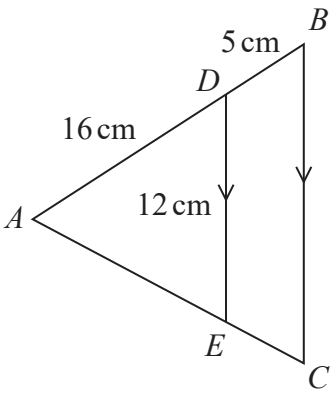

Diagram **NOT** accurately drawn

The diagram shows triangle ABC and triangle ADE.

The point D lies on AB and the point E lies on AC such that DE is parallel to BC.

$AD = 16\,\text{cm}$ $DB = 5\,\text{cm}$ $DE = 12\,\text{cm}$

Calculate the length, in cm, of BC.

..... cm

(Total for Question 6 is 2 marks)

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7

$$A = 2^3 \times 3^2 \times 5^4$$
$$B = 2^2 \times 3^3 \times 5^n$$

Given that the Lowest Common Multiple (LCM) of A and B is 3 375 000

find the value of the integer n.
Show your working clearly.

$n =$ .....

(Total for Question 7 is 2 marks)

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8 $y = 4x^5 - \frac{8}{x^2}$

Find $\frac{dy}{dx}$

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

(Total for Question 8 is 2 marks)

9

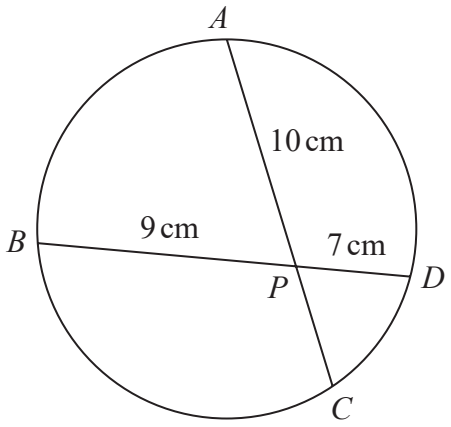

Diagram **NOT** accurately drawn

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

The chord AC intersects the chord BD at P

$AP = 10\,\text{cm}$ $BP = 9\,\text{cm}$ $PD = 7\,\text{cm}$

Calculate the length, in cm, of PC

..... cm

(Total for Question 9 is 2 marks)

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10 $\mathbf{M} = \begin{pmatrix} 2 & x \\ -0.5 & -1.5 \end{pmatrix}$

Given that the determinant of matrix **M** is 0.5

find the value of x.

$x =$ .....

(Total for Question 10 is 2 marks)

11

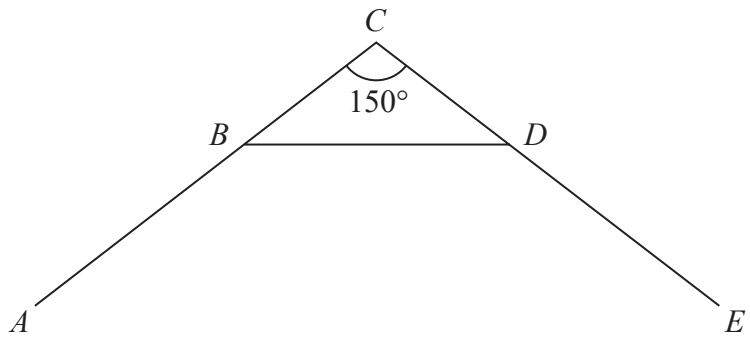

Diagram **NOT** accurately drawn

In the diagram, AB, BD and DE are three sides of a regular polygon with n sides.

The point C is such that ABC and EDC are straight lines and $\angle BCD = 150°$

Calculate the value of n.

$n =$ .....

(Total for Question 11 is 3 marks)

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12 At the end of a college course, Pierre has to take five examinations.
Each examination is marked out of 100
Pierre has to get an overall mean mark of 80% or more for the five examinations in order to pass the course.

After taking the first four examinations, Pierre's mean mark for these four examinations is 78%

Calculate the lowest mark Pierre can get in his fifth examination so that he passes the course.

.....

(Total for Question 12 is 3 marks)

13 Solve $\frac{6x-3}{7} - \frac{2x-3}{5} = \frac{6}{5}$

Show clear algebraic working.

$x =$ .....

(Total for Question 13 is 3 marks)

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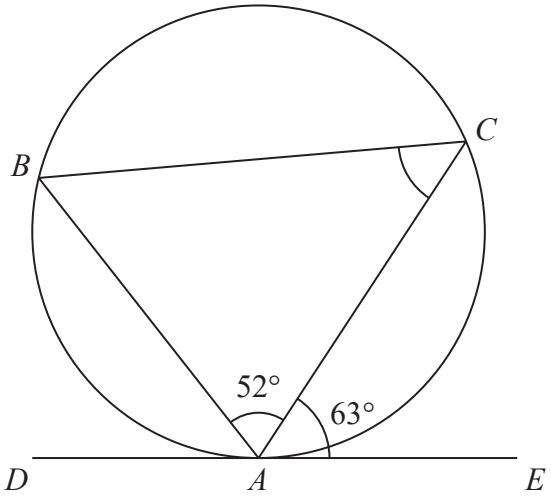
14



Dia **NOT**
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In the diagram, A, B and C are points on a circle.

DAE is the tangent to the circle at A.

$\angle BAC = 52°$ and $\angle CAE = 63°$

Calculate the size, in degrees, of $\angle ACB$.
Give reasons for each stage of your working.

.....
°

(Total for Question 14 is 3 marks)

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15 Given that m and n are integers, write $\dfrac{4+\sqrt{20}}{\sqrt{5}-2}$ in the form $m + n\sqrt{5}$

Show each stage of your working clearly.

.....

(Total for Question 15 is 3 marks)

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16 $P = a - \frac{b}{c}$

a = 15 to the nearest 5
b = 8.5 to one decimal place
c = 5 to one significant figure

Calculate the lower bound of P
Show your working clearly.

.....

(Total for Question 16 is 3 marks)

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17 Given that, for all values of x,

$$8x^2 - 48x + 10 = a(x + b)^2 + c \text{ where } a, b \text{ and } c \text{ are integers,}$$

find the value of a, the value of b and the value of c.
Show your working clearly.

$a =$ .....

$b =$ .....

$c =$ .....

(Total for Question 17 is 3 marks)

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18 The volume of a solid right circular cylinder is 225 cm^3

The height of the cylinder is 7 cm.

Work out the total surface area, in cm^2 to 3 significant figures, of the cylinder.

..... cm^2

(Total for Question 18 is 4 marks)

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19

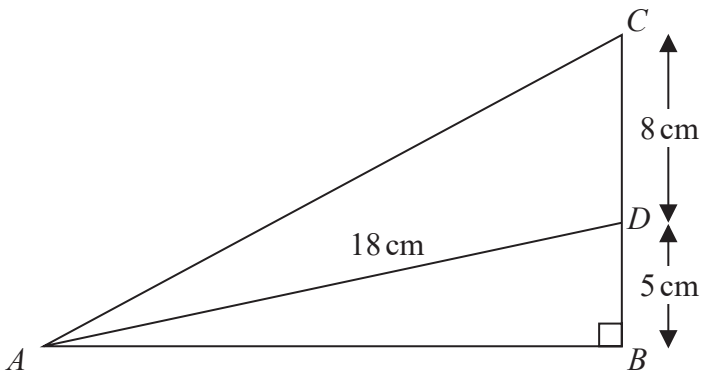

Diagram **NOT** accurately drawn

The diagram shows a right-angled triangle ABC in which $\angle ABC = 90°$

D is the point on BC such that

$BD = 5\text{ cm}$ $\quad$ $DC = 8\text{ cm}$ $\quad$ $AD = 18\text{ cm}$

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

.....°

(Total for Question 19 is 4 marks)

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20 Make x the subject of the formula $y = 5 + \dfrac{3x + 4}{7 - x}$

Give your answer in its simplest form.

.....

(Total for Question 20 is 4 marks)

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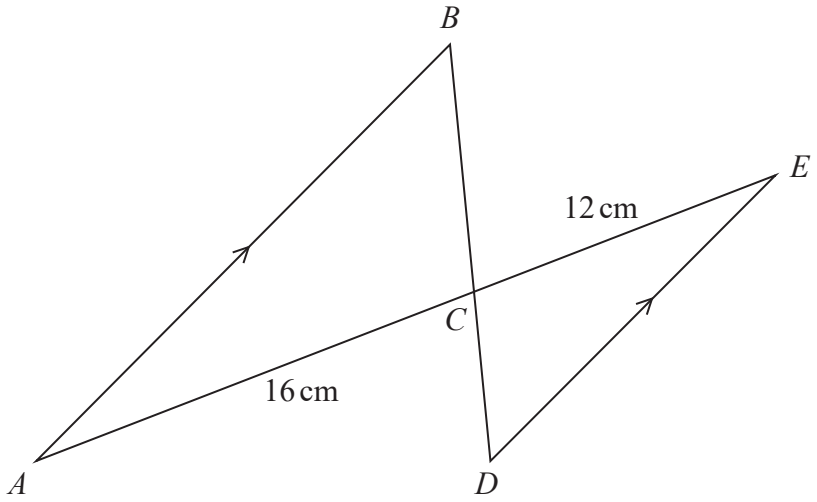

Diagram **NOT** accurately drawn

The diagram shows triangle ABC and triangle EDC.

AB is parallel to DE.

$AC = 16\,\text{cm}$ and $CE = 12\,\text{cm}$.

Given that the area of triangle ABC is $31.5\,\text{cm}^2$ greater than the area of triangle EDC, work out the area of triangle EDC.

..... cm^2

(Total for Question 21 is 4 marks)

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22 The table shows information about the lengths of time, in minutes, that 70 people w for a train.

Length of time (m minutes)	**Frequency**
$0 < m \leqslant 10$	25
$10 < m \leqslant 20$	16
$20 < m \leqslant 30$	14
$30 < m \leqslant 40$	11
$40 < m \leqslant 50$	4

(a) Write down the modal class.

.....

(1)

(b) Calculate an estimate, to one decimal place, of the mean number of minutes waited.

..... minutes

(3)

(Total for Question 22 is 4 marks)

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23 The students who go to Crown Academy either live in village A or in village B such

number of students from village A : number of students from village $B = 5 : 7$

15% of the students from village A travel by bus to Crown Academy.

$\frac{2}{7}$ of the students from village B travel by bus to Crown Academy.

Of the students from village A and village B who do not travel by bus to Crown Academy, $\frac{3}{4}$ walk to Crown Academy.

Find what fraction of the students walk to Crown Academy.

.....

(Total for Question 23 is 4 marks)

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24 Find the two values of x such that

$$\frac{12^{3x} \times 3^{4x^2-3x} \times 3}{24^{2x}} = 27$$

Show your working clearly.

.....

(Total for Question 24 is 4 marks)

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25 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$
$A = \{2, 3, 5, 6, 9, 10\}$
$B = \{3, 4, 6, 9, 12\}$

List the members of

(a) $A \cap B$

.....

(1)

(b) $A \cup B$

.....

(1)

(c) A'

.....

(1)

$C = \{5, 6, 7\}$

(d) Write down all the subsets of C.

.....

(3)

(Total for Question 25 is 6 marks)

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26 (a) Solve the inequality $7d + 3 \leqslant 5d$

.....

(2)

(b) Expand and simplify $5a(2a - 3) - 4a(3a + 1)$

.....

(2)

(c) Simplify fully $\dfrac{30x^3y^4}{5xy^3}$

.....

(2)

(d) Factorise $15n^2 - 11n - 14$

.....

(2)

(Total for Question 26 is 8 marks)

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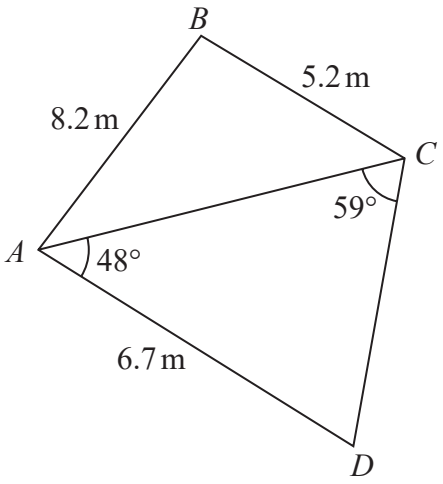
27



Diag **NOT** accurate awn

The diagram shows quadrilateral $ABCD$ such that

$AB = 8.2\,\text{m}$ $BC = 5.2\,\text{m}$ $AD = 6.7\,\text{m}$

$\angle CAD = 48°$ $\angle ACD = 59°$

Find the area, in m^2 to 3 significant figures, of quadrilateral $ABCD$.

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..... m^2

(Total for Question 27 is 5 marks)

Turn over for Question 28

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28 The curve C has equation $y = 2x^3 - \frac{21}{2}x^2 + 12x + 5$

The points P and Q lie on C.

P is the point with coordinates (1, 8.5)

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

Calculate the gradient of the line PQ.
Show your working clearly.

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.....

(Total for Question 28 is 6 marks)

Turn over for Question 29

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29 Given that $(x - 5)$ is a factor of $3x^3 - 20x^2 + kx + 10$ where k is a constant,

(a) use the factor theorem to show that $k = 23$

(2)

(b) Solve the equation $3x^3 - 20x^2 + 23x + 10 = 0$
Show clear algebraic working.

.....

(4)

(Total for Question 29 is 6 marks)

(TOTAL FOR PAPER IS 100 MARKS)

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