


Please check the examination details below before entering your candidate information

Candidate surname					Other names				
Pearson Edexcel		Centre Number				Candidate Number			
International GCSE		<input type="text"/>				<input type="text"/>			
Monday 7 January 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 EIGHT questions.

Write your answers in the spaces provided.

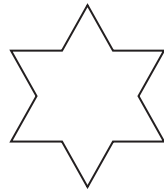
You must write down all the stages in your working.

- 1 Express 15 centimetres as a percentage of 3 metres.

%

(Total for Question 1 is 2 marks)

2



A



B

The diagram shows shape **A** and shape **B**.

Write down,

- (a) the number of lines of symmetry of shape **A**,

(1)

- (b) the order of rotational symmetry of shape **B**.

(1)

(Total for Question 2 is 2 marks)



3 The bearing of ship P from ship Q is 057°

Find the bearing of ship Q from ship P .

(Total for Question 3 is 2 marks)

4
$$\mathbf{A} = \begin{pmatrix} 2 & -1 \\ -3 & 5 \end{pmatrix} \quad \mathbf{B} = \begin{pmatrix} -1 & 2 \\ 3 & -3 \end{pmatrix}$$

Calculate $3\mathbf{A} + 2\mathbf{B}$

$\left(\quad \right)$

(Total for Question 4 is 2 marks)



- 5 Without using a calculator and showing all your working, evaluate

$$2\frac{1}{4} \times 2\frac{2}{3}$$

Give your answer in its simplest form.

(Total for Question 5 is 2 marks)

- 6 Given that $y = 7x^2 - \frac{3}{x}$

find $\frac{dy}{dx}$

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

(Total for Question 6 is 2 marks)

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7 Here are the first 4 terms of a sequence.

4096 -1024 256 -64

(i) Write down the next 2 terms of the sequence.

(ii) Explain how you found your answer.

(Total for Question 7 is 3 marks)

8 Ying has 4 black counters and 3 white counters.

There is a number on each counter.

The mean of the numbers on the black counters is 11.5

The mean of the numbers on the white counters is 9

Calculate the mean, to 3 significant figures, of the numbers on all 7 counters.

(Total for Question 8 is 3 marks)



P 6 0 7 9 4 A 0 5 2 4

- 9 Find the largest integer value of x such that $17 - 2x \geq 4(x - 5)$
Show clear algebraic working.

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(Total for Question 9 is 3 marks)

- 10 A regular polygon has n sides.
Each interior angle of the regular polygon is 135° **greater** than each exterior angle of the polygon.
Find the value of n .

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$n =$

(Total for Question 10 is 3 marks)



- 11 A piece of ribbon 9 metres long is cut into 3 parts in the ratios 3:5:7 by length.

Calculate the length, in metres, of the longest piece.

m

(Total for Question 11 is 3 marks)

- 12 (a) Write 9.6×10^{-7} as an ordinary number.

(1)

(b) Calculate $\frac{2.4 \times 10^{199}}{9.6 \times 10^{-7}}$

Give your answer in standard form.

(2)

(Total for Question 12 is 3 marks)



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

$$\sqrt{605} - \sqrt{80}$$

in the form \sqrt{n} where n is an integer.

(Total for Question 13 is 3 marks)

14 Solve the equation

$$5x^2 = 7 - 9x$$

Give your solutions to 3 significant figures.
Show your working clearly.

(Total for Question 14 is 3 marks)

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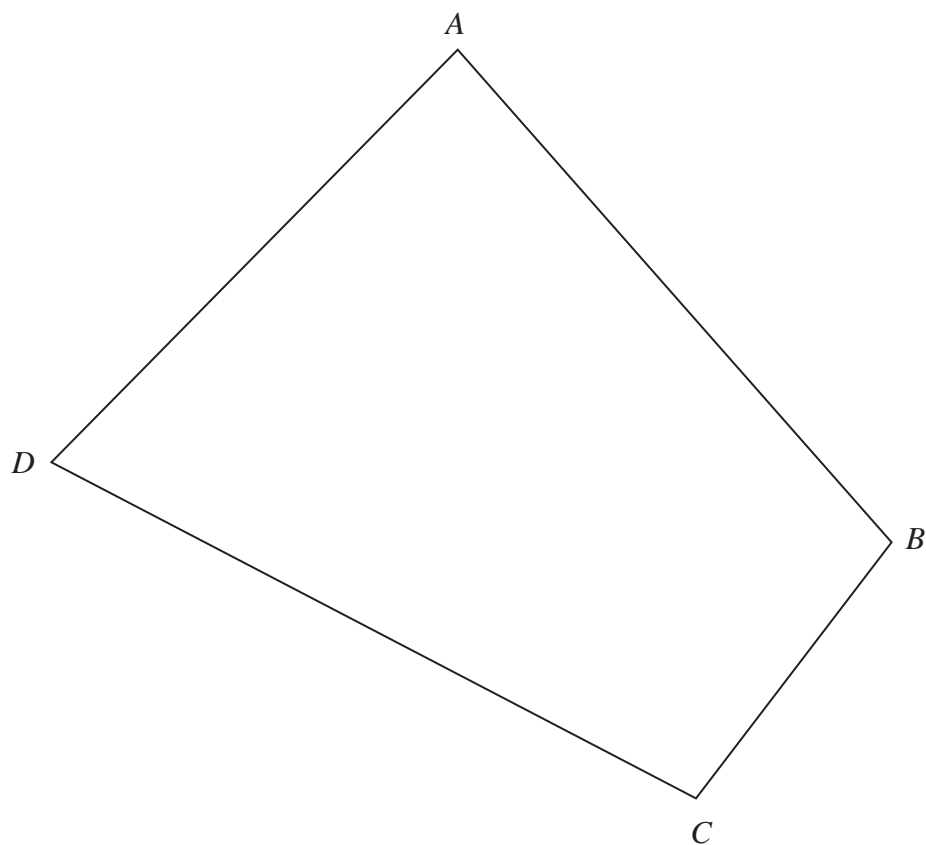
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15



The diagram shows quadrilateral $ABCD$.

The point P lies inside the quadrilateral, such that P is 5.5 cm from C **and** equidistant from AD and AB .

Using ruler and compasses only and **showing all your construction lines**, show the point P on the diagram.

(Total for Question 15 is 4 marks)



P 6 0 7 9 4 A 0 9 2 4

- 16 t varies inversely as the square of a where $a > 0$
 $t = 14$ when $a = 5$

Calculate the value of a when $t = 224$

$a =$

(Total for Question 16 is 4 marks)

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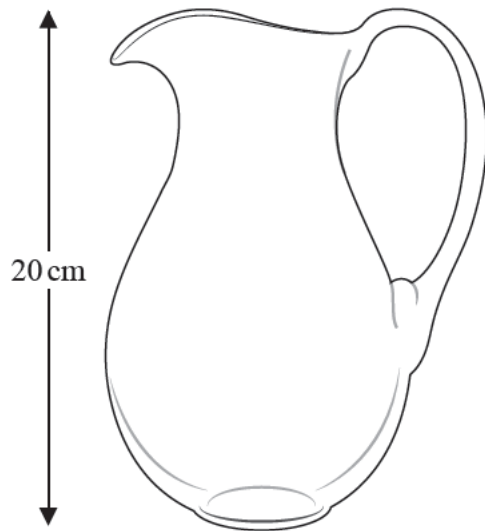
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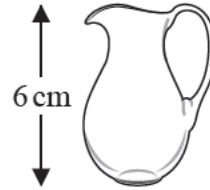
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17



A

Diagram **NOT**
accurately drawn

B

The diagram shows two similar jugs.

The height of jug **A** is 20 cm and the height of jug **B** is 6 cm.

Given that

$$\text{volume of jug A} - \text{volume of jug B} = 1459.5 \text{ cm}^3$$

calculate the volume, in cm^3 , of jug **B**.

 cm^3

(Total for Question 17 is 4 marks)



P 6 0 7 9 4 A 0 1 1 2 4

18 $\mathcal{E} = \{\text{positive integers from 1 to 15 inclusive}\}$

$A = \{\text{multiples of 3}\}$

$B = \{\text{even numbers}\}$

(a) Find $A \cup B$

$$A \cup B = \{ \hspace{15em} \} \quad (1)$$

(b) (i) Find $A \cap B$

$$A \cap B = \{ \hspace{15em} \} \quad (1)$$

(ii) Find $n([A \cap B]')$

$$n([A \cap B]') = \hspace{10em} (1)$$

The set C has 8 elements and $B \cap C = \emptyset$

(c) Write down the elements of set C .

$$C = \{ \hspace{15em} \} \quad (1)$$

(Total for Question 18 is 4 marks)

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19 Solve the simultaneous equations

$$10x + 2y = 17$$

$$15x - 3y = 39$$

$$x = \quad , y =$$

(Total for Question 19 is 4 marks)

20 The coordinates of point A are $(7, 2)$ and the coordinates of point B are $(-5, y)$.

The modulus of the vector \vec{AB} is 13

Calculate the possible values of y .

$$y =$$

(Total for Question 20 is 4 marks)



- 21 The straight line joining the points with coordinates $(-a, -22)$ and $(3a, 38)$ has equation $y = mx + a$

Calculate the value of a and the value of m .

$$a =$$

$$m =$$

(Total for Question 21 is 4 marks)

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22

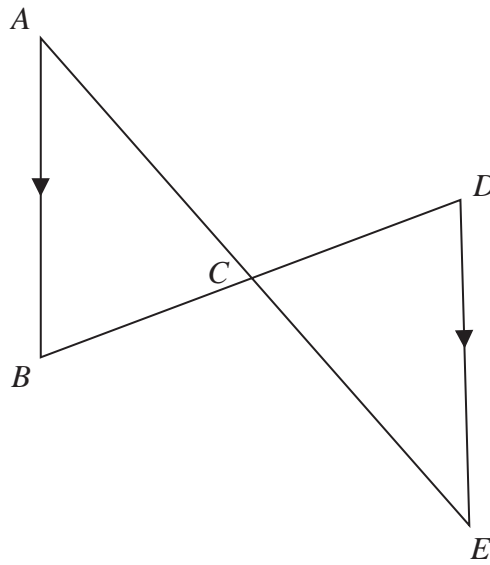


Diagram **NOT**
accurately drawn

In the diagram ACE and BCD are straight lines such that the point C is the midpoint of BD .

AB is parallel to DE .

Prove that the triangles ABC and EDC are congruent.

(Total for Question 22 is 4 marks)



P 6 0 7 9 4 A 0 1 5 2 4

- 23 A right circular cone has a curved surface area of $136\pi\text{cm}^2$
The radius of the base of the cone is 8 cm
The volume of the cone is $k\pi\text{cm}^3$

Find the value of k .

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$$k =$$

(Total for Question 23 is 4 marks)



24 Solve $3 - \frac{x+1}{2x^2+9x-5} - \frac{2x-1}{x+5} = 1$

Show clear algebraic working.

$x =$

(Total for Question 24 is 4 marks)



P 6 0 7 9 4 A 0 1 7 2 4

25 There are 20 counters in a bag.
There are 7 red counters.
The rest of the counters are green or white.

Bernard takes at random 2 counters from the bag.

The probability that Bernard will take 2 white counters is $\frac{1}{19}$

Calculate the probability that Bernard will take 1 green counter and 1 white counter.

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(Total for Question 25 is 5 marks)



- 26 The table below gives information about the lengths of time that 50 people have been waiting for a train.

Waiting time (m minutes)	Frequency
$0 < m \leq 5$	4
$5 < m \leq 10$	5
$10 < m \leq 15$	11
$15 < m \leq 20$	8
$20 < m \leq 25$	22

- (a) Find the modal class.

(1)

- (b) Find the class interval that contains the median waiting time.

(2)

- (c) Calculate an estimate for the mean waiting time.

minutes

(3)

(Total for Question 26 is 6 marks)



27

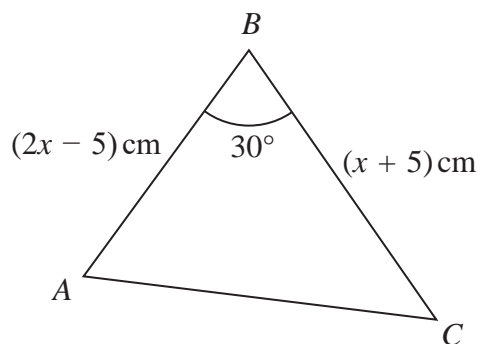


Diagram **NOT**
accurately drawn

The diagram shows $\triangle ABC$ in which

$$AB = (2x - 5) \text{ cm} \quad BC = (x + 5) \text{ cm} \quad \angle ABC = 30^\circ$$

The area of $\triangle ABC$ is 15.75 cm^2

Calculate the length, in cm to 3 significant figures, of AC .

cm

(Total for Question 27 is 6 marks)



28 (a) Factorise fully $15x^3y - 20x^2y^2$

(2)

(b) Simplify fully $\frac{(27x^6)^{\frac{2}{3}}}{18x^3}$

(3)

(c) Given that $(x - 2)$ is a factor of $2x^3 + 3x^2 + kx - 6$

find the value of k .

$k =$

(2)

(Total for Question 28 is 7 marks)

TOTAL FOR PAPER IS 100 MARKS





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