Write your name here

Surname		Other names

Pearson Edexcel International GCSE

Centre Number

Candidate Number

Mathematics B
Paper 1

Thursday 24 May 2018 – Morning
Time: 1 hour 30 minutes

Paper Reference
4MB0/01

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

P 5 3 3 4 9 A 0 1 2 4

Answer ALL TWENTY NINE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Given that $\mathbf{a} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} 1 \\ -2 \end{pmatrix}$

   find, as a column vector, $\mathbf{a} - 2\mathbf{b}$

$\begin{pmatrix} \\ \end{pmatrix}$

(Total for Question 1 is 2 marks)

2 On Monday, 150 students were asked how they got to school that morning.
   Yuen is going to draw a pie chart for the results.

   Given that 27 students said they got to school by bus on Monday, calculate the size,
   in degrees, of the angle of the sector in the pie chart for bus.

....°

(Total for Question 2 is 2 marks)

3 Ahmed and Bilek share prize money in the ratio 3 : 4
Ahmed gives 20% of his share of the money to charity.

Find the fraction of the prize money Ahmed gives to charity.

....

(Total for Question 3 is 2 marks)

4 At a party $\dfrac{3}{4}$ of the people are adults.

The rest are children.

There are 24 adults at the party.

Calculate the number of children at the party.

....

(Total for Question 4 is 2 marks)
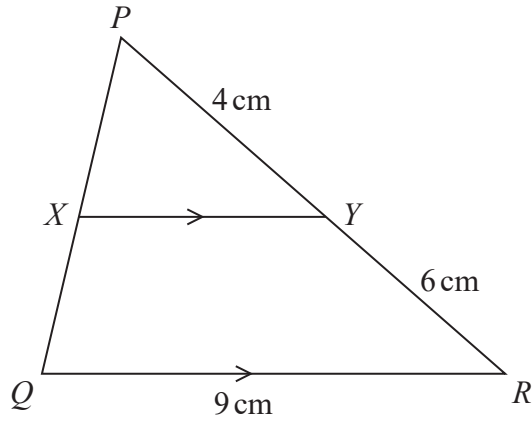
Turn over ▶

5

Diagram **NOT** accurately drawn

In the diagram, *XY* is parallel to *QR*.
PXQ and *PYR* are straight lines.

PY = 4 cm, *YR* = 6 cm, *QR* = 9 cm.

Calculate the length of *XY*.

.... cm

(Total for Question 5 is 2 marks)

6 Express $\dfrac{3}{2x} + \dfrac{1}{2x^2}$ as a fraction in its lowest terms.

....

(Total for Question 6 is 2 marks)

7 A circle has a circumference of 40 cm.

Calculate the area, in cm² to 3 significant figures, of the circle.

.... cm²

(Total for Question 7 is 3 marks)

8

2*a* cm

16 cm

3*a* cm
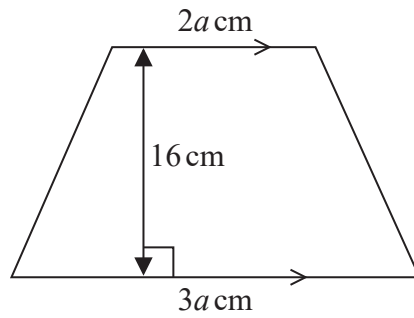
Diagram **NOT**
accurately drawn

The diagram shows a trapezium with area 100 cm²

Find the value of *a*.

a = ...

(Total for Question 8 is 3 marks)

9 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$A = \{2, 3, 5, 8\}$
$B = \{2, 4, 6, 8\}$

List the elements of the set

(a) $A \cap B$

$A \cap B = \{\text{...}\}$

(1)

List the elements of the set

(b) $A' \cup B$

$A' \cup B = \{\text{...}\}$

(2)

(Total for Question 9 is 3 marks)

10 Solve $2 - 4(x - 2) = x - 12$

Show clear algebraic working.

$x = \text{...}$

(Total for Question 10 is 3 marks)

11 The nth term of a sequence is u_n where $u_n = 25 - 2n$

(a) Find u_1

....

(1)

(b) Find the greatest value of n for which $u_n > n$

....

(2)

(Total for Question 11 is 3 marks)

12 Solve the simultaneous equations

$$2x - 3y = 8$$
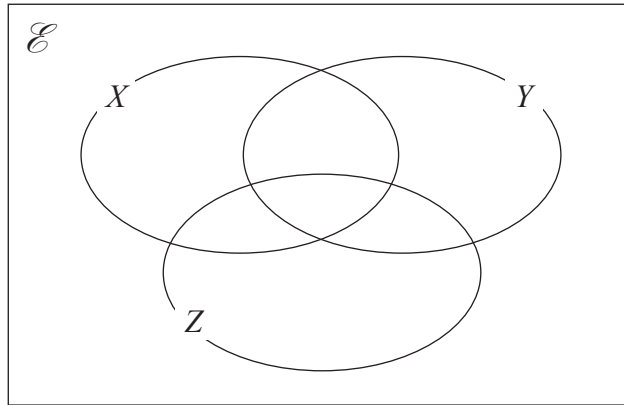
$$\frac{y}{2} = x - 3$$

Show clear algebraic working.

$x =$ ....

$y =$ ....

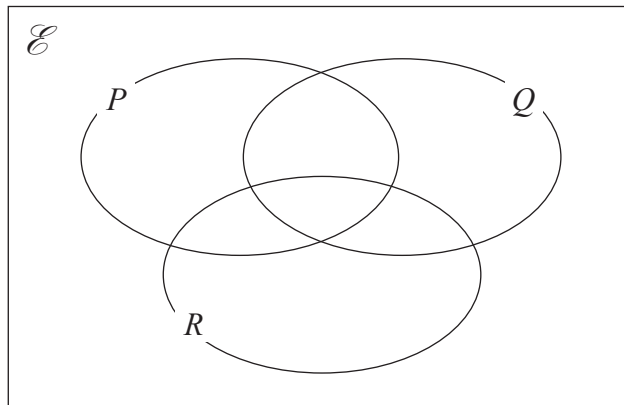**(Total for Question 12 is 3 marks)**

P 5 3 3 4 9 A 0 7 2 4

13 (a) On the Venn diagram below, shade the set $(X \cup Y) \cap Z$
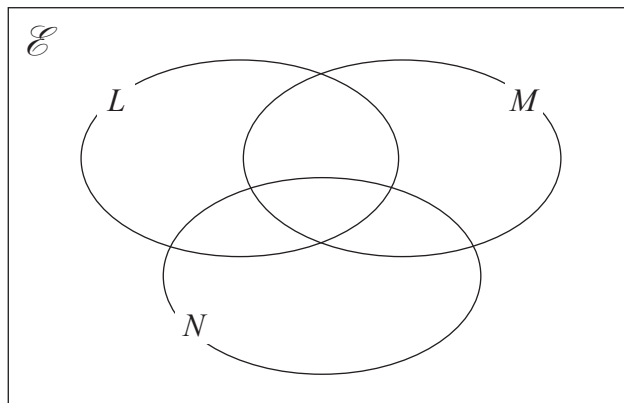

(1)

(b) On the Venn diagram below, shade the set $(P \cap Q') \cap R$

(1)

(c) On the Venn diagram below, shade the set $(L \cup M) \cap (L \cup N)'$

(1)

(Total for Question 13 is 3 marks)

14 Given that $x = 2y$ and $y = 3z$ and $x:y:z = a:b:c$ where a, b and c are positive integers, find the least possible value of abc.

....

(Total for Question 14 is 3 marks)

15 Jenny has some microbeads.
The mass of each microbead is 6.4×10^{-6} grams.

Find, to 2 significant figures, the number of microbeads needed to have a total mass of 5 kilograms.

....

(Total for Question 15 is 3 marks)

16 The point A with coordinates $(2, 12)$ lies on the curve **C**.

Given that the equation of **C** is $y = 2x^3 - 5x + 6$

find the gradient of **C** at the point A.

....

(Total for Question 16 is 3 marks)

17 Simplify fully $(2x + 1)^2 - (2x - 2)(2x + 1)$

....

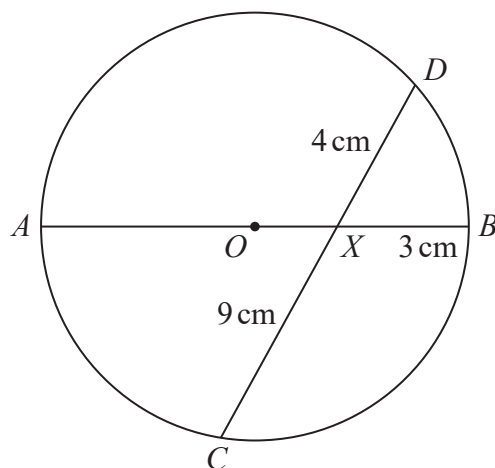**(Total for Question 17 is 3 marks)**

18

Diagram **NOT** accurately drawn

A, *D*, *B* and *C* are four points on a circle with centre *O*.
The chord *CD* intersects the diameter *AB* at *X* such that
DX = 4 cm, *BX* = 3 cm and *CX* = 9 cm.

Find the length, in cm, of *OX*.

.... cm

(Total for Question 18 is 3 marks)

19 Given that $\mathbf{A} = \begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 1 & -1 \\ 3 & 1 \end{pmatrix}$

find $\mathbf{AB} + \mathbf{B}$

$$\begin{pmatrix} & \\ & \end{pmatrix}$$

(Total for Question 19 is 3 marks)

20 A rhombus has diagonals of length 10 cm and 24 cm.

(a) Find the area of the rhombus.

.... cm^2

(2)

(b) Find the perimeter of the rhombus.

.... cm

(2)

(Total for Question 20 is 4 marks)

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21 The number of runners in a 2017 marathon was 16% more than the number of runners in the 2016 marathon.
The number of runners in the 2016 marathon was 175

(a) Calculate the number of runners in the 2017 marathon.

....
(2)

The prize for winning the 2017 marathon was 20% more than the prize for winning the 2016 marathon.
The prize for winning the 2017 marathon was $750

(b) Calculate the prize for winning the 2016 marathon.

$...
(2)

(Total for Question 21 is 4 marks)

22

Diagram **NOT** accurately drawn

The diagram shows a kite $ABCD$ in which $BD = 10$ cm.
$\angle ADC = 50°$ and $\angle DAB = \angle DCB = 90°$

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

.... cm

(Total for Question 22 is 4 marks)

23 The table shows information about the numbers of fish caught by some anglers one afternoon.

Number of fish caught	Frequency
0	1
1	5
2	6
3	a
4	7
5	1

The mean number of fish caught is 2.6

Calculate the value of a.
Show clear algebraic working.

a = ...

(Total for Question 23 is 4 marks)

24

ABC is a triangle.
Showing all your construction lines, construct

(a) the perpendicular bisector of *AB*,

(2)

(b) the bisector of ∠*ABC*.

(2)

The point *P* lies on the perpendicular bisector of *AB* and on the bisector of ∠*ABC*.

(c) Measure and write down the length, in cm, of *CP*.

.... cm

(1)

(Total for Question 24 is 5 marks)

25
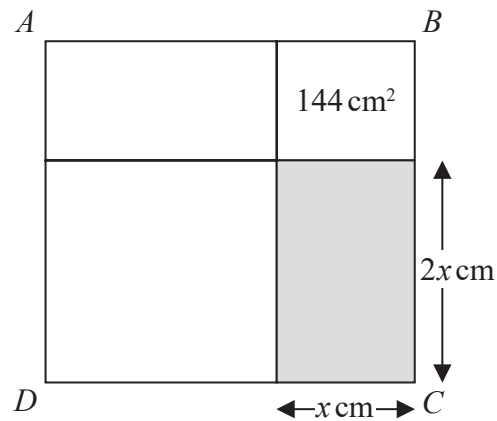

The diagram shows a square $ABCD$ divided into 4 rectangles by 2 straight lines.
As shown, the area of one rectangle is $144\,\text{cm}^2$ and the shaded rectangle has sides of length x cm and $2x$ cm.

Given that the area of the square $ABCD$ is $1156\,\text{cm}^2$, find the possible values of x.
Show clear algebraic working.

....

(Total for Question 25 is 5 marks)

P 5 3 3 4 9 A 0 1 7 2 4

26 (a) Given that $y > 0$, express $\dfrac{y \times \sqrt{y}}{y^{-2}}$ as a single power of y.

....

(2)

(b) Given that $4^{3n} = 2 \times 8^n$
find the value of 8^n

....

(3)

(Total for Question 26 is 5 marks)

27 $(x + 1)$ is a factor of $x^3 + kx^2 + x + 6$ where k is a constant.

(a) Find the value of k.

$k = $ ....

(2)

(b) Using this value of k, factorise completely $x^3 + kx^2 + x + 6$

....

(3)

(Total for Question 27 is 5 marks)

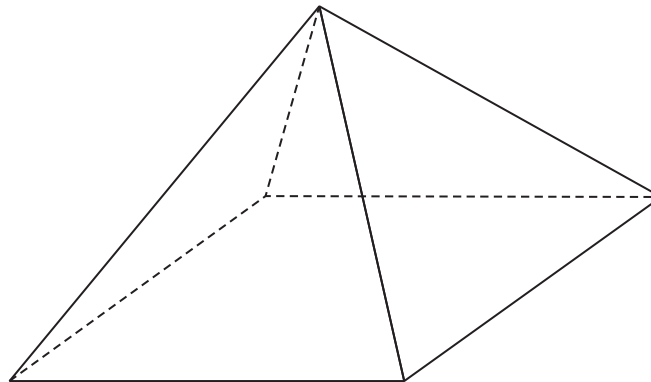P 5 3 3 4 9 A 0 1 9 2 4

28

Diagram **NOT** accurately drawn

The diagram shows a solid right pyramid.
Each of the eight edges of the pyramid has length 10 cm.

(a) Calculate the total surface area, in cm^2 to 3 significant figures, of the pyramid.

.... cm^2

(3)

(b) Calculate the volume, in cm^3 to 3 significant figures, of the pyramid.

.... cm^3

(4)

(Total for Question 28 is 7 marks)

29 Two boxes, **A** and **B**, each contain 1 white bead and 7 green beads.

Two beads are taken at random from box **A** and put into box **B**.
Two beads are then taken at random from box **B** and put into box **A**.

Find the probability that box **A** still contains 1 white bead and 7 green beads.

....

(Total for Question 29 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

P 5 3 3 4 9 A 0 2 3 2 4

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P 5 3 3 4 9 A 0 2 4 2 4