Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | Candidate Number

Tuesday 19 May 2020

Morning (Time: 1 hour 30 minutes) | Paper Reference **4MB1/01**

Mathematics B

Paper 1

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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P 6 1 9 0 6 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 Solve the inequality $7x + 3 \leqslant 4x - 15$

.....

(Total for Question 1 is 2 marks)

2 Show that

$$4\frac{2}{7} \div \frac{5}{21} = 18$$

(Total for Question 2 is 2 marks)

3 The nth term of a sequence is given by $3n^2 + 11$

Calculate the difference between the 6th term and the 9th term of the sequence.

.....

(Total for Question 3 is 2 marks)

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

$B = 2^2 \times 3^2 \times 5 \times 7$

(i) Find the Lowest Common Multiple (LCM) of A and B.

.....

(1)

(ii) Find the Highest Common Factor (HCF) of A and B.

.....

(1)

(Total for Question 4 is 2 marks)

5 The price of each sandwich in a cafe was increased by 4%
Chris bought a sandwich after the price increase for $3.64

Calculate the increase in the price of the sandwich Chris bought.

$.....

(Total for Question 5 is 2 marks)

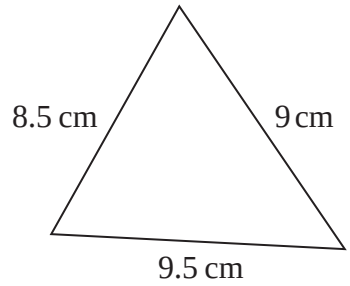
6 Given that $a : b = 3 : 5$ and that $a : c = 7 : 4$

find $a : b : c$
Give your answer in its simplest form.

$a : b : c =$ .....

(Total for Question 6 is 2 marks)

7



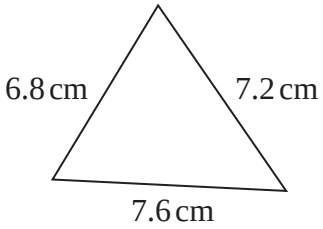


Diagram **NOT** accurately drawn

The diagram shows two triangles.

Show that the triangles are similar.

(Total for Question 7 is 2 marks)

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

find $\frac{dy}{dx}$

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

(Total for Question 8 is 2 marks)

9 The table gives information about the number of brothers that each student in a class has.

Number of brothers	Frequency
0	5
1	2
2	8
3	4
4	1

Calculate the mean number of brothers.

.....

(Total for Question 9 is 3 marks)

10 Without using a calculator and showing your working clearly, find the value of the integer a so that

$$\sqrt{180} - \sqrt{27} - \sqrt{20} + \sqrt{147} = a(\sqrt{5} + \sqrt{3})$$

$a =$ .....

(Total for Question 10 is 3 marks)

11 Solve $\dfrac{x+5}{4} + \dfrac{x-3}{5} = 2$

Show clear algebraic working.

$x =$ .....

(Total for Question 11 is 3 marks)

12 The diagram shows a half cylinder.

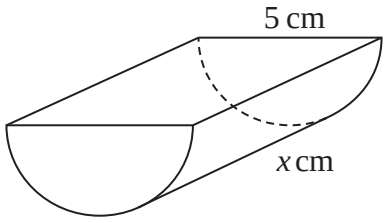


Diagram **NOT** accurately drawn

The half cylinder has a length of x cm and a semicircular cross section of diameter 5 cm.

The volume of the half cylinder is 35π cm^3

Calculate the value of x.

$x =$ .....

(Total for Question 12 is 3 marks)

13 (a) Simplify $m^{12} \div m^3$

.....

(1)

(b) Simplify fully $(125p^9w^3)^{\frac{2}{3}}$

.....

(2)

(Total for Question 13 is 3 marks)

14 Given that

$$p = \frac{2}{6n + 5} \quad \text{and} \quad n = \frac{5}{4m + 2}$$

find an expression for p in terms of m.
Give your answer in its simplest form.

$p =$ .....

(Total for Question 14 is 3 marks)

15 Akash drove from his home to his friend's house.

The distance Akash drove was 190 km, to the nearest 5 km.
His average speed for the journey was 62 km/h, to the nearest km/h.

Calculate the upper bound for the time taken by Akash to drive from his home to his friend's house.
Give your answer in hours and minutes, to the nearest minute.

..... hours ..... minutes

(Total for Question 15 is 4 marks)

16

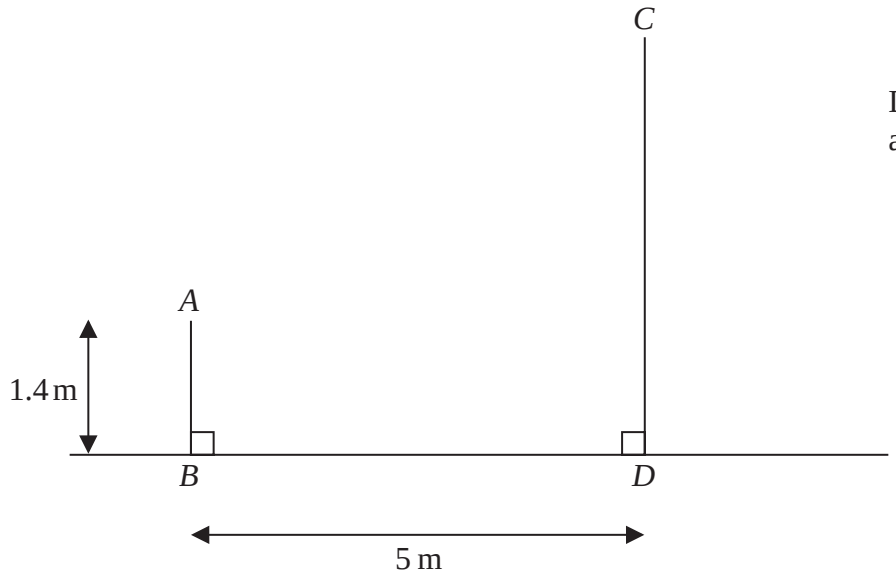


Diagram **NOT** accurately drawn

In the diagram, *AB* represents a vertical wall and *CD* represents a vertical building. The height of the wall is 1.4 m.

The bottom of the wall, *B*, and the bottom of the building, *D*, are on horizontal ground, such that *BD* = 5 m.

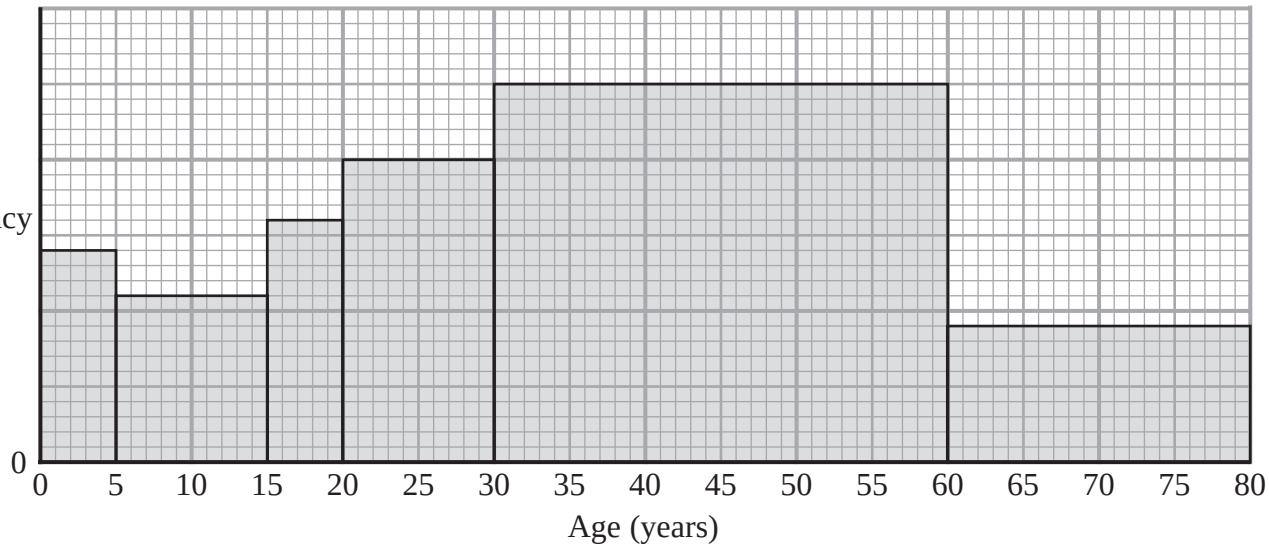
The angle of elevation of *C* from *A* is 75°

Calculate the height, in m to one decimal place, of the building.

..... m

(Total for Question 16 is 4 marks)

17 The histogram below shows information about the age of each person on a plane.



There were 7 people on the plane with an age of 5 years or under.

Calculate the number of people on the plane with an age of over 20 years.

.....

(Total for Question 17 is 3 marks)

18 A varies directly as the square of c

$A = 950$ when $c = 5$

Calculate the value of A when $c = 7$

$A =$ .....

(Total for Question 18 is 3 marks)

19 Solve the simultaneous equations $5x - 3y = 21$
$3x - 4y = 22.5$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 19 is 4 marks)

20

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

Find

(a) $\mathbf{A} - \mathbf{B}$

(2)

(b) $\mathbf{AB}$

(2)

(Total for Question 20 is 4 marks)

21

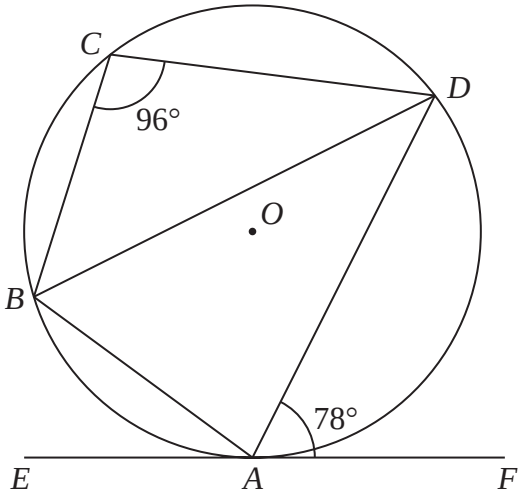


Diagram **NOT** accurately drawn

ABCD is a quadrilateral such that the points *A*, *B*, *C* and *D* lie on a circle, centre *O*.
EAF is the tangent to the circle at *A*.

$\angle DAF = 78°$ $\angle BCD = 96°$

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

$\angle BDA =$ ..... °

(Total for Question 21 is 4 marks)

22 Given that $\dfrac{20 \times 25^{5n+3}}{4 \times (\sqrt{125})^{4n+2}}$ can be written in the form 5^y

find an expression for y in terms of n.

$y =$ .....

(Total for Question 22 is 4 marks)

23 The function g is such that

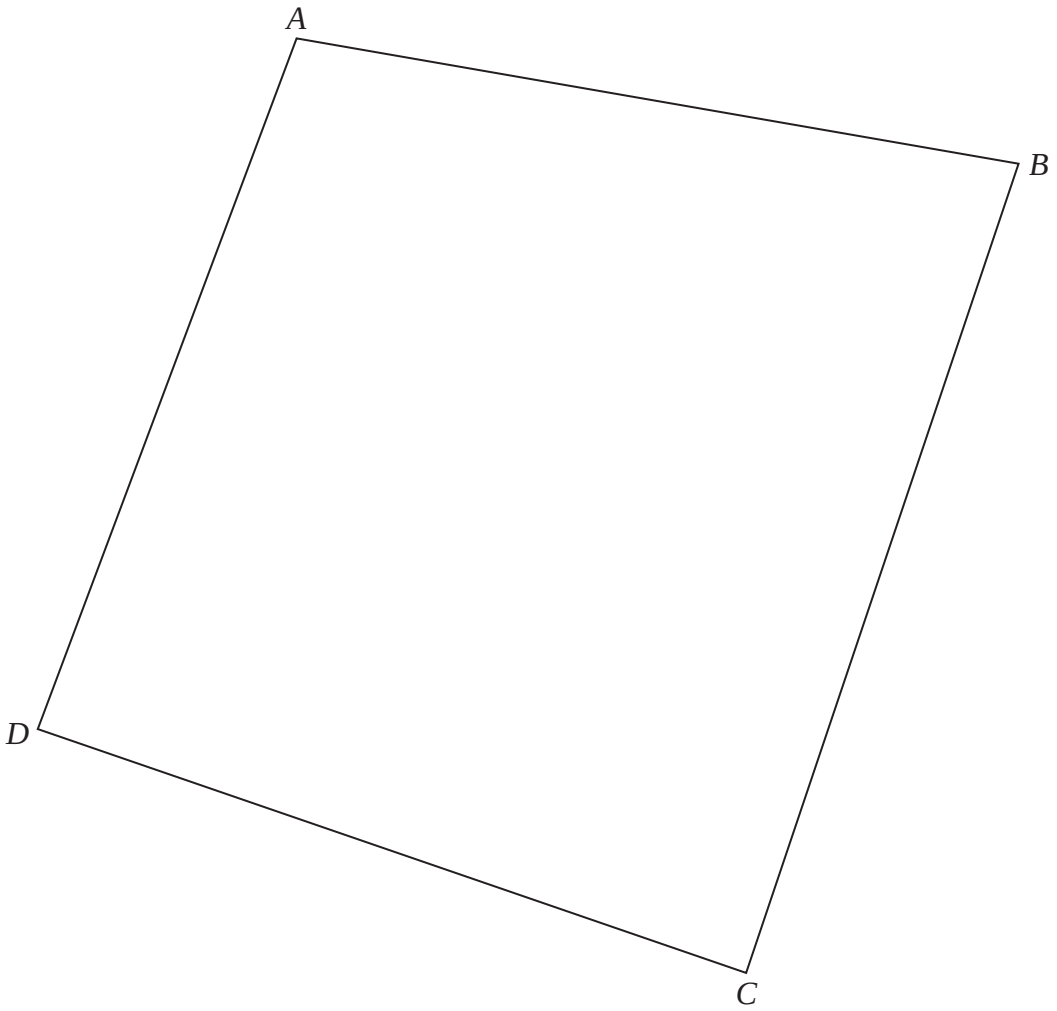
$$g(x) = 9 - 10x - 5x^2 \quad \text{for all values of } x$$

Find the range of g.
Show clear algebraic working.

.....

(Total for Question 23 is 4 marks)

24



ABCD is a quadrilateral.
Leaving in all of your construction lines, construct the locus of all points inside the quadrilateral that are

(a) 4 cm from *B*,

(1)

(b) equidistant from *B* and *C*,

(2)

(c) equidistant from the lines *DA* and *DC*.

(2)

The region **R** consists of all the points inside the quadrilateral that are more than 4 cm from *B*, closer to *B* than to *C* and closer to *DC* than to *AD*,

(d) show, by shading, the region **R**.
Label the region **R**.

(1)

(Total for Question 24 is 6 marks)

25 (a) Make a the subject of the formula $B = ac + de$

.....

(2)

(b) Factorise fully $14x^2y^3 - 21x^5y^2$

.....

(2)

(Total for Question 25 is 4 marks)

26

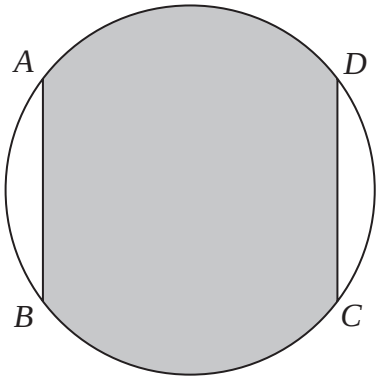


Diagram **NOT** accurately drawn

The diagram shows a circle of radius $2x$ cm.

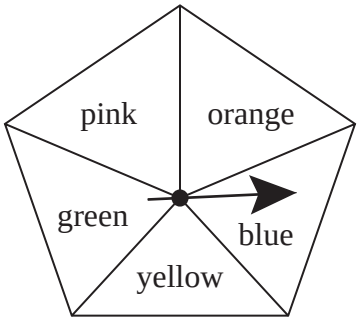
The lines AB and DC are parallel and $AB = DC = 2x$ cm.
The area of the region shown shaded in the diagram is kx^2 cm^2

Find the exact value of k.

$k =$ .....

(Total for Question 26 is 5 marks)

27 Aarya has a biased 5-sided spinner.



When the spinner is spun once, it can land on blue or yellow or green or pink or orange.
Aarya spins the spinner many times and records the colour that the spinner lands on each time.
She uses these results to calculate the probability of the spinner landing on each colour.

The table below gives the probabilities that Aarya calculated for blue, yellow and green.

Colour	blue	yellow	green	pink	orange
Probability	0.22	0.34	0.12		

Aarya's calculations showed that the probability of the spinner landing on orange is 3 times the probability of the spinner landing on pink.

(a) Complete the table for pink and for orange.

(3)

When Aarya spun the spinner, it landed on green 90 times.

(b) Work out an estimate for the total number of times Aarya spun the spinner.

.....

(2)

(Total for Question 27 is 5 marks)

28

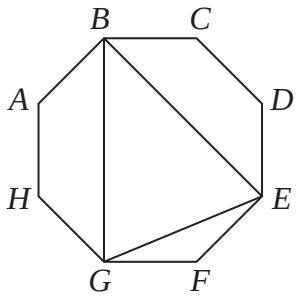


Diagram **NOT** accurately drawn

In the diagram, *ABCDEFGH* is a regular octagon.
The area of triangle *GEF* is $\left(4\sqrt{2}\right)$ cm^2

Calculate the perimeter, in cm to one decimal place, of triangle *BEG*.

..... cm

(Total for Question 28 is 7 marks)

Turn over for Question 29

29 (a) Use the factor theorem to show that $(x - 5)$ is a factor of $x^3 - 6x^2 - 7x + 60$

(2)

(b) Hence factorise completely $x^3 - 6x^2 - 7x + 60$

.....

(3)

(Total for Question 29 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS