Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International GCSE

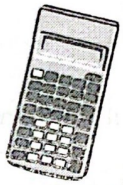
Monday 11 November 2024

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 ▶

Pearson

Answer ALL TWENTY SEVEN questions.

Write your answers in the spaces provided.

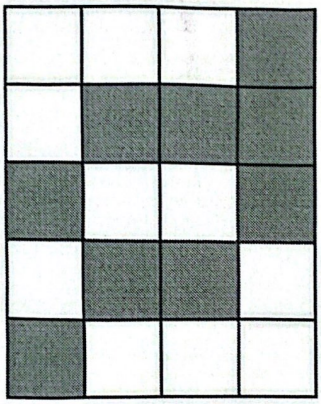
You must write down all the stages in your working.

1 Factorise fully $28ab + 21b$

.....

(Total for Question 1 is 2 marks)

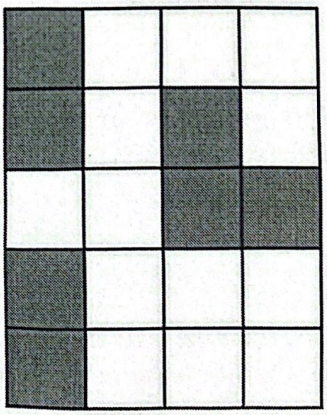
2 A pattern is made with white squares and shaded squares.



(a) Shade **one** more square to make a pattern with rotational symmetry of order 2

(1)

Here is a different pattern made from white squares and shaded squares.

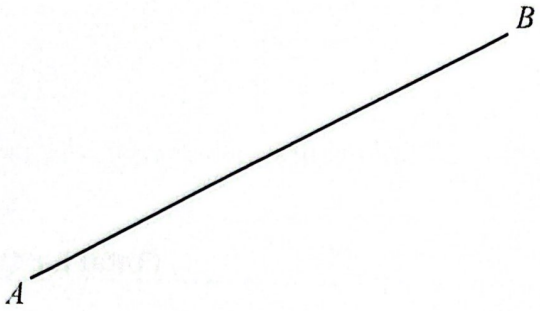


(b) Shade **one** more square to make a pattern with exactly one line of symmetry.

(1)

(Total for Question 2 is 2 marks)

3 Using ruler and compasses only and **showing all your construction lines**, construct the perpendicular bisector of AB



(Total for Question 3 is 2 marks)

4 The bearing of Port A from Port B is 276°

Find the bearing of Port B from Port A

.....°

(Total for Question 4 is 2 marks)

5 Solve $\frac{5}{7}x = \frac{2}{7}x + 18$

$x =$ .....

(Total for Question 5 is 2 marks)

6 $A = 2^x \times 3^2 \times 7^4$

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

Given that $x > 2$ and $y > 4$

find the highest common factor (HCF) of A and B

.....

(Total for Question 6 is 2 marks)

7 A biased dice has six faces numbered 1, 2, 3, 4, 5 and 6

The table below shows information about the probability that, when the dice is thrown once, it will land on each of the numbers.

Number	1	2	3	4	5	6
Probability	0.1	0.3	0.18	0.03	0.32	0.07

The dice is thrown 300 times.

Calculate the expected number of times the dice will land on a number greater than 3

.....

(Total for Question 7 is 2 marks)

8 3kg of onions cost £1.71
2kg of onions and 5kg of potatoes cost £5.34

Calculate the total cost, in £, of 3kg of onions and 4kg of potatoes.

£.....

(Total for Question 8 is 3 marks)

9

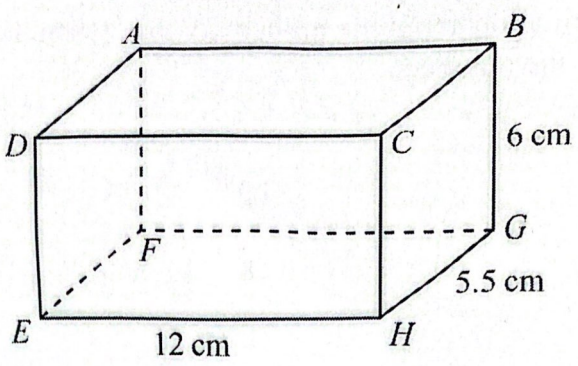


Diagram **NOT** accurately drawn

The diagram shows a solid cuboid $ABCDEFGH$

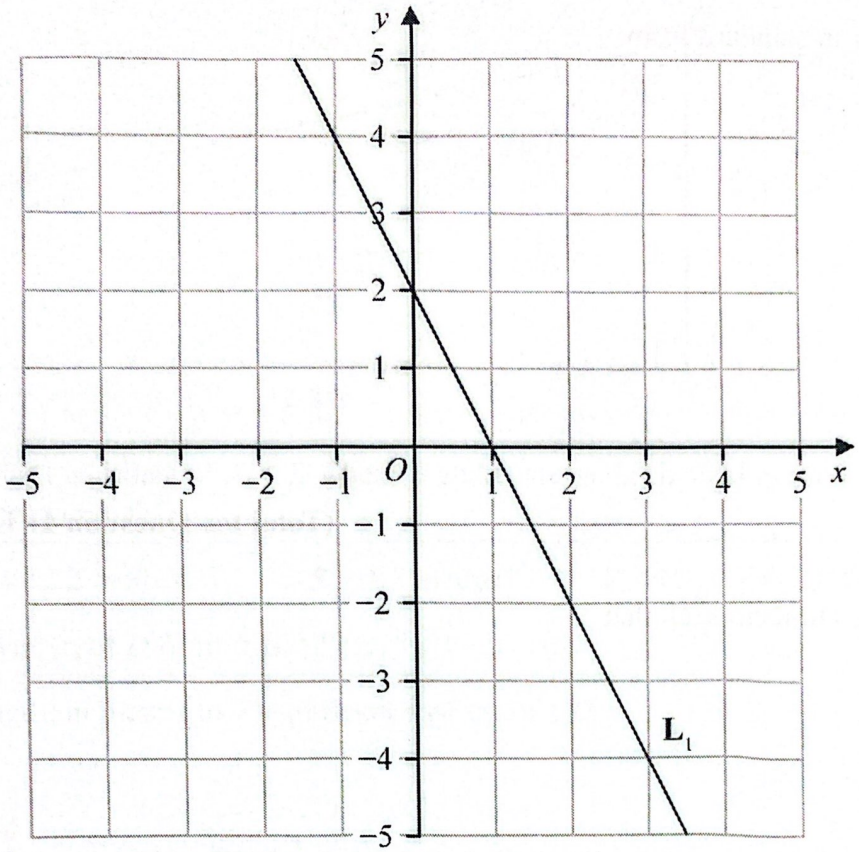
$EH = 12\,\text{cm}$ $GH = 5.5\,\text{cm}$ $BG = 6\,\text{cm}$

Calculate the total surface area, in cm^2, of the cuboid.

..... cm^2

(Total for Question 9 is 3 marks)

10



The straight line $\mathbf{L}_1$ is drawn on the grid.
The straight line $\mathbf{L}_2$ is parallel to $\mathbf{L}_1$ and passes through the point with coordinates $(-9, 12)$

Find an equation for $\mathbf{L}_2$
Give your answer in the form $y = mx + c$

.....

(Total for Question 10 is 3 marks)

11 Calculate $\left(2.3 \times 10^{114}\right) \div \left(4.6 \times 10^{117}\right)$

Give your answer in standard form.

(Total for Question 11 is 2 marks)

12 A, B, C and D are numbers such that

$A : B = 2 : 5$

$A : D = 3 : 8$

$B : C = 9 : 11$

Find $C : D$

Give your answer in its simplest form.

13

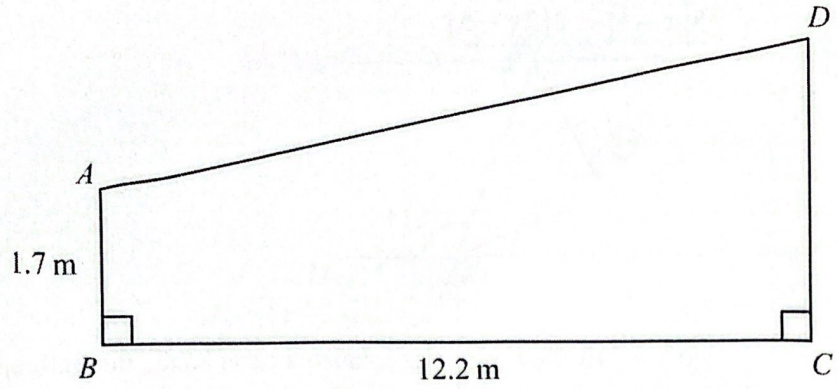


Diagram **NOT** accurately drawn

The diagram shows quadrilateral $ABCD$ where B and C are on horizontal ground and BA and CD are vertical.

$BC = 12.2$ metres $\quad AB = 1.7$ metres $\quad \angle ABC = \angle BCD = 90°$

The angle of elevation of D from A is $32°$

Calculate the length, in metres to 3 significant figures, of CD

..... metres

(Total for Question 13 is 3 marks)

14 Write as a single fraction in its simplest form

$$\frac{5(x-1)}{7} - \frac{2(2x-5)}{4}$$

.....

(Total for Question 14 is 3 marks)

15 A team takes part in a sports league.

After 12 games its mean score per game is 96
After 14 games its mean score per game is 98

The ratio of its score in game 13 to its score in game 14 is 2 : 3

Calculate its score in game 14

.....

(Total for Question 15 is 4 marks)

16

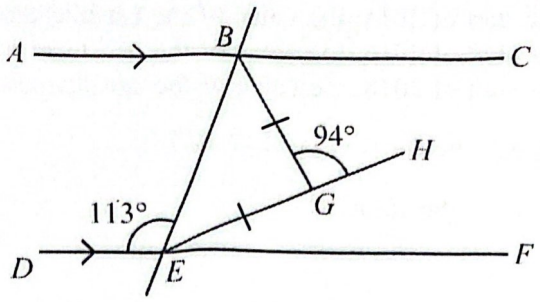


Diagram **NOT** accurately drawn

In the diagram, BGE is an isosceles triangle with $EG = BG$

ABC, DEF and EGH are straight lines.
ABC is parallel to DEF

$\angle DEB = 113°$ $\angle BGH = 94°$

Find the size, in degrees, of $\angle CBG$
Give a reason for each stage of your working.

$\angle CBG =$ ..... °

(Total for Question 16 is 4 marks)

17 At the start of 2012, Fatima bought a car for \$15 500

From the start of 2012 to the start of 2014, the value of the car decreased by 8%
From the start of 2014 to the start of 2016, the value of the car decreased by 2.2%
From the start of 2016 to the start of 2018, the value of the car decreased by x%

At the start of 2018, the value of the car was \$13 137.40

Calculate, to 2 significant figures, the value of x

$x =$ .....

(Total for Question 17 is 4 marks)

18 Make t the subject of $r = \sqrt{\dfrac{5t-7}{8-3t}}$

.....

(Total for Question 18 is 4 marks)

19 $\mathbf{A} = \begin{pmatrix} 2 & 1 \\ 4 & 3 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} 3 & -3 \\ 0 & 2 \end{pmatrix}$

(a) Find **AB**

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

(2)

$\mathbf{C} = \begin{pmatrix} 3 & 2 \\ 5 & 6 \end{pmatrix}$

(b) Find $\mathbf{C}^{-1}$

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

(2)

(Total for Question 19 is 4 marks)

20

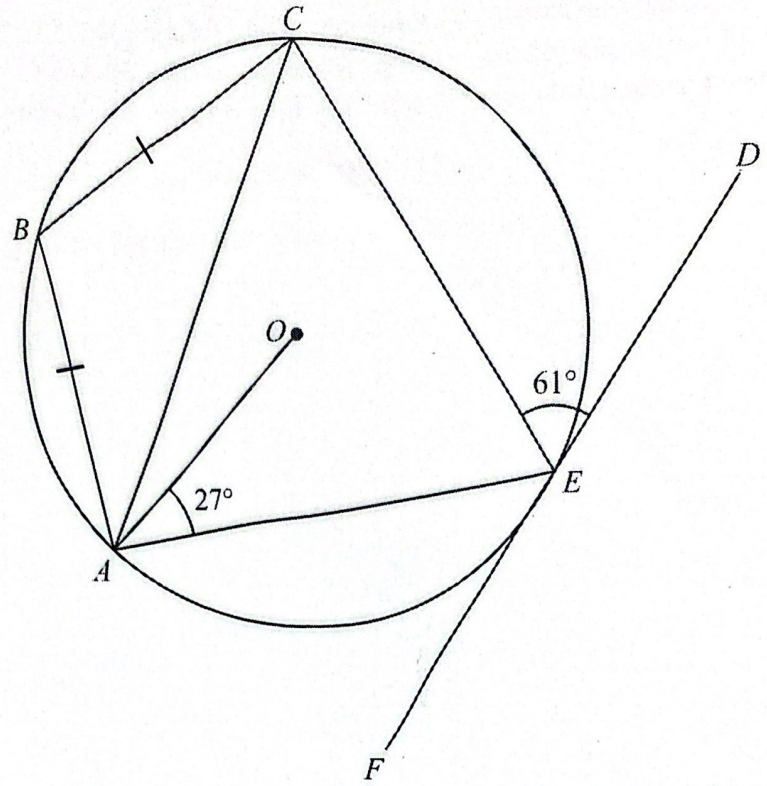


Diagram **NOT** accurately drawn

In the diagram A, B, C and E are points on a circle with centre O
DEF is the tangent to the circle at the point E

$BA = BC$ $\angle OAE = 27°$ $\angle CED = 61°$

Find the size, in degrees, of $\angle BCE$

$\angle BCE =$ ..... °

(Total for Question 20 is 4 marks)

21 $v^2 - u^2 = 2as$

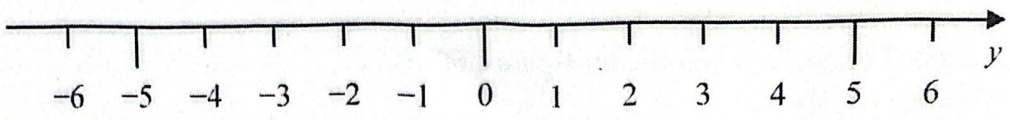
$v = 25.4$ to 1 decimal place
$u = 9.512$ to 4 significant figures
$s = 15$ to the nearest 5

Calculate the upper bound, to 3 significant figures, of a
Show your working clearly.

.....

(Total for Question 21 is 4 marks)

22 (a) On the number line, represent the inequality $-5 < y \leqslant 3$



(2)

(b) Solve the inequality $4x + 2 \geqslant 3(7 - 2x)$

.....

(3)

(Total for Question 22 is 5 marks)

23 (a) Use the factor theorem to show that $(x + 5)$ is a factor of $2x^3 + 9x^2 - 11x - 30$

(2)

(b) Hence, factorise completely $2x^3 + 9x^2 - 11x - 30$
Show clear algebraic working.

.....

(4)

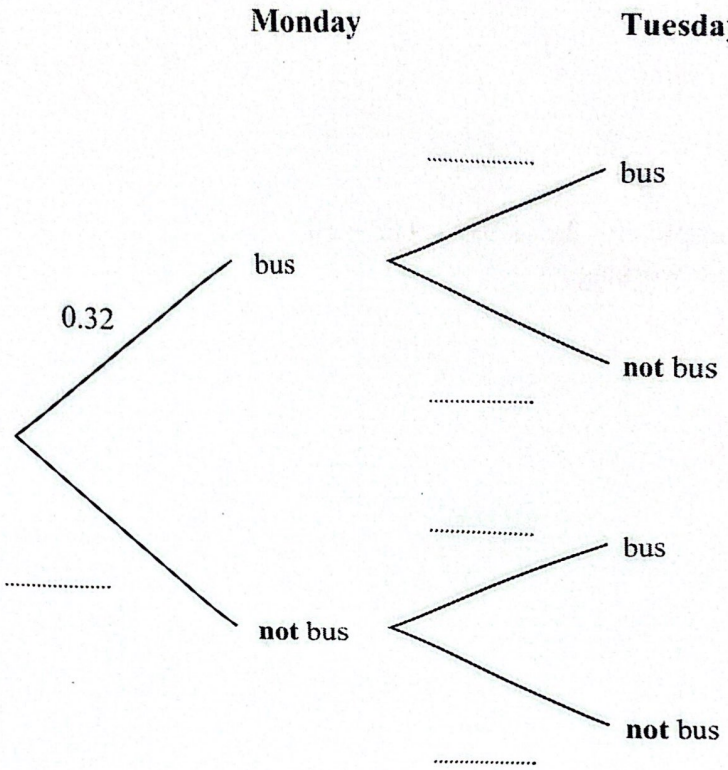
(Total for Question 23 is 6 marks)

24 The probability that Lethna takes the bus to work on Monday is 0.32

If Lethna takes the bus on Monday, the probability that she takes the bus on Tuesday is 0.47

If Lethna does **not** take the bus on Monday, the probability she will **not** take the bus on Tuesday is 0.71

(a) Complete the tree diagram for this information.



(2)

E is the event that Lethna takes the bus on exactly one of either Monday or Tuesday.
F is the event that Lethna does not take the bus on Monday and does not take the bus on Tuesday.

(b) Find which of the events, E or F, has the greater probability.
Show your working clearly.

(3)

(Total for Question 24 is 5 marks)

25

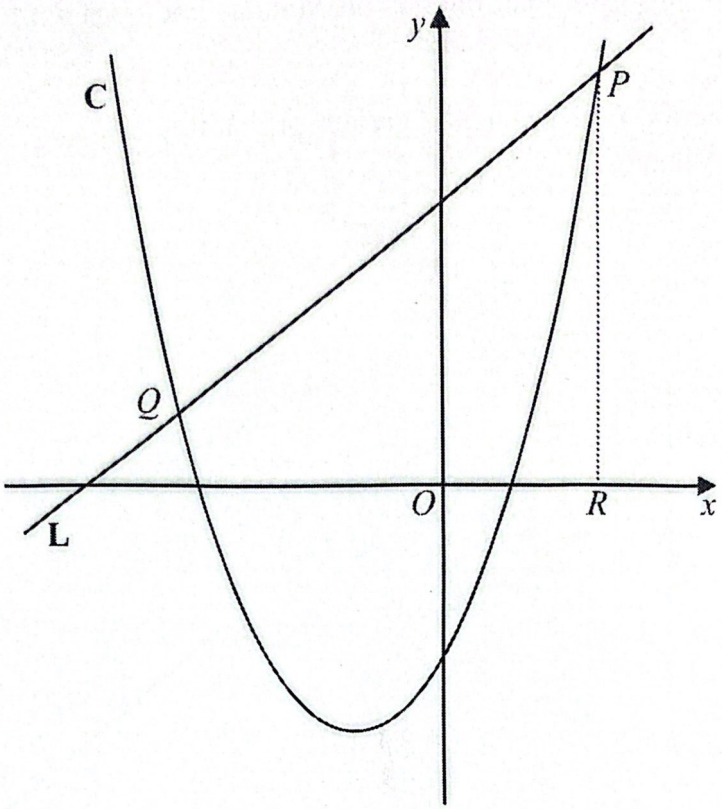


Diagram **NOT** accurately drawn

The diagram shows part of the curve **C** with equation $y = 3x^2 + 16x - 35$ and part of the line **L** with equation $2y - 11x = 110$

P and Q are the points of intersection of **C** and **L**
R is the point on the x-axis such that PR is parallel to the y-axis.

Show that the area of triangle PQR is $442.75\,\text{cm}^2$
You must show clear algebraic working.

Question 25 continued

(Total for Question 25 is 7 marks)

26

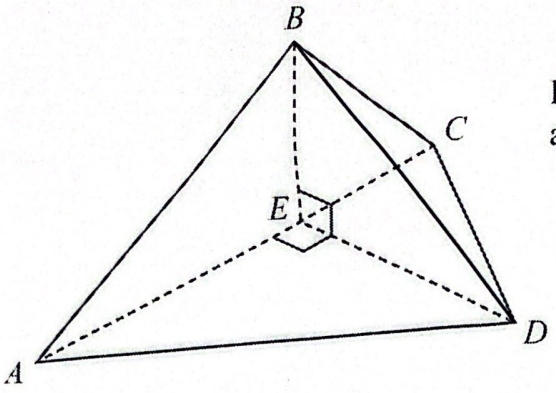


Diagram **NOT** accurately drawn

The diagram shows a solid pyramid **P** with vertices A, B, C and D

ACD is the horizontal triangular base of **P**

E is the point on AC such that $AE = \frac{3}{5}AC$

$AC = 15.5\,\text{cm}$ $CD = 8.2\,\text{cm}$ $\angle AED = 90°$

(a) Calculate, in cm to 3 significant figures, the length of ED

..... cm

(2)

The solid pyramid **T** is mathematically similar to **P**

The area of the triangular base of **T** is $64.9\,\text{cm}^2$

Given that vertex B is vertically above point E and $\angle EBD = 71°$

(b) calculate, in cm^3 to 3 significant figures, the volume of **T**

..... cm^3

(7)

(Total for Question 26 is 9 marks)

27 A curve with equation $y = 9x^2 - 16x + 5$ is drawn on a grid where 1 unit = 1 cm on each axis.

P and Q are two points on the curve.
P is the point with coordinates $(1,-2)$
The gradient of the tangent to the curve at Q is 6.5

Find the length, in cm to 3 significant figures, of PQ
You must show clear algebraic working.

..... cm

(Total for Question 27 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS