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 **4MB1/01**

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 7 2 4 7 7 A 0 1 2 4

Pearson

Answer ALL TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The nth term of a sequence is given by $6n^2 - 5$

Find the difference between the 2nd term and the 4th term of the sequence.

.....

(Total for Question 1 is 2 marks)

2 Find the Highest Common Factor (HCF) of 60 and 165
Show your working clearly.

.....

(Total for Question 2 is 2 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

3 Factorise fully $6af + 30f^2$

.....

(Total for Question 3 is 2 marks)

4 Without using a calculator and showing all your working, calculate

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

Give your answer as a mixed number in its simplest form.

.....

(Total for Question 4 is 2 marks)

5 Solve the inequality $5x \leqslant 3x + 15$

.....

(Total for Question 5 is 2 marks)

6 Calculate $\left(4.2 \times 10^{72}\right) \times \left(5.5 \times 10^{75}\right)$
Give your answer in standard form.

.....

(Total for Question 6 is 2 marks)

7 The price of a holiday is reduced by 4% in a sale.
Haniya pays $600 of the sale price when she books the holiday.
She pays the remainder of the sale price in 4 equal monthly payments of $180

Calculate the price of the holiday before the sale.

$.....

(Total for Question 7 is 3 marks)

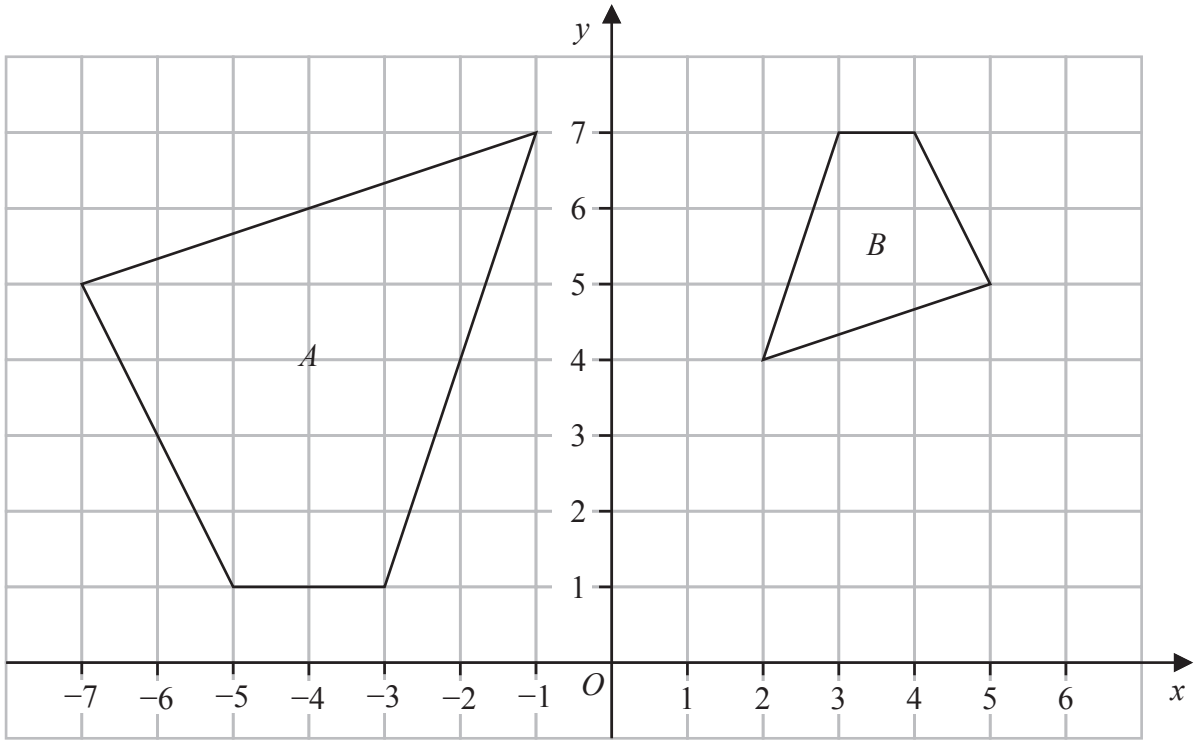
8 The straight line $\mathbf{L}_1$ has equation $y + 4x = 5$
The straight line $\mathbf{L}_2$ is parallel to $\mathbf{L}_1$ and passes through the point $(2, -6)$

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

.....

(Total for Question 8 is 3 marks)

9



Quadrilateral A and quadrilateral B are drawn on a grid.

Quadrilateral B is the **image** of quadrilateral A under a single transformation.

Describe fully this single transformation.

.....

.....

(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

$$2\sqrt{300} - \sqrt{108} = \sqrt{a}$$

$a =$ .....

(Total for Question 10 is 3 marks)

11 (a) Write down the value of a^0 where $a > 0$

.....

(1)

(b) Simplify fully $2w^2 \times 11w^5$

.....

(1)

(c) Simplify fully $\left(4y^8\right)^{\frac{3}{2}}$

.....

(2)

(Total for Question 11 is 4 marks)

12

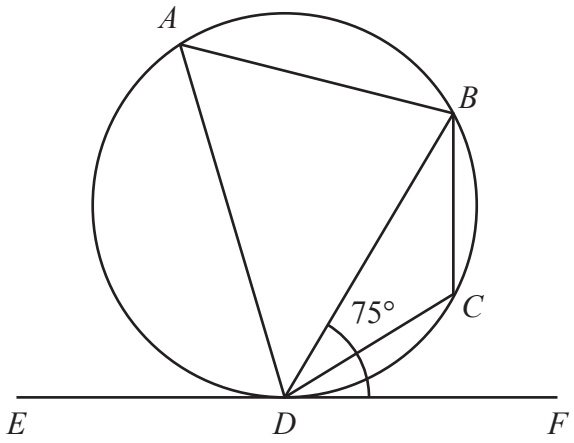


Diagram **NOT** accurately drawn

A, *B*, *C* and *D* are points on a circle.
EDF is the tangent to the circle at the point *D*

Angle *BDF* = 75°

Calculate, giving your reasons, the size, in degrees, of $\angle BCD$

.....°

(Total for Question 12 is 3 marks)

13 $a = \dfrac{v - u}{t}$

$v = 8.91$ to 3 significant figures.
$u = 5.82$ to 3 significant figures.
$t = 9$ to 1 significant figure.

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

.....

(Total for Question 13 is 3 marks)

14

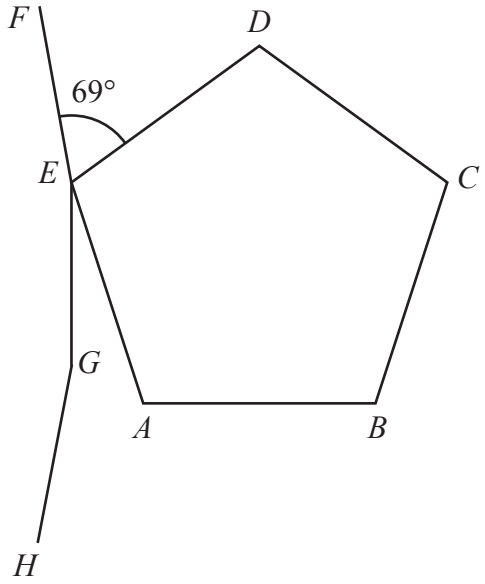


Diagram **NOT** accurately drawn

The diagram shows a regular pentagon $ABCDE$ and three sides, FE, EG and GH, of a regular n-sided polygon.

AB is horizontal.
EG is vertical.

$\angle DEF = 69^\circ$

Calculate the value of n

$n =$ .....

(Total for Question 14 is 4 marks)

15 The diagram shows a sphere of radius r cm and a right circular cone with base radius r cm and vertical height 20 cm.

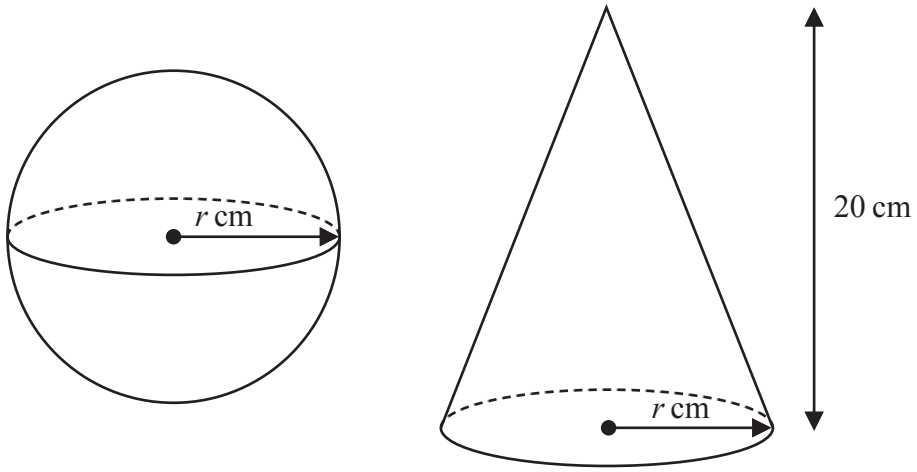


Diagram **NOT** accurately drawn

The volume of the sphere is 1.5 times the volume of the cone.

Find the value of r

$r =$ .....

(Total for Question 15 is 4 marks)

16 P is inversely proportional to the square root of W
$P = 1600$ when $W = 1.96$

Find the value of W when $P = 800$

$W =$ .....

(Total for Question 16 is 4 marks)

17 Quadrilateral A is transformed to quadrilateral B under a reflection in the line $y = -x$

Quadrilateral B is transformed to quadrilateral C under the matrix $\begin{pmatrix} 4 & -2 \\ 1 & 3 \end{pmatrix}$

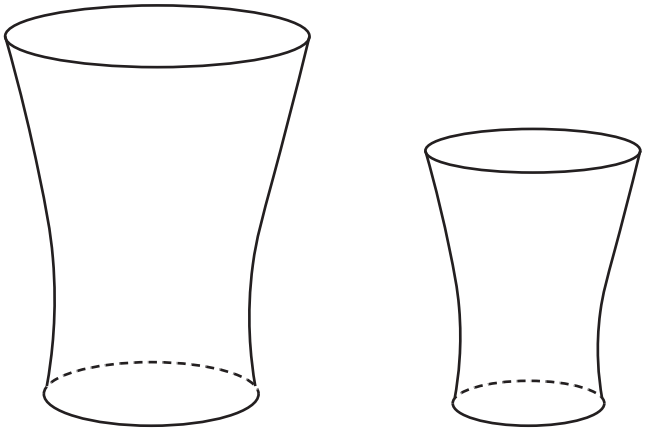
Quadrilateral C is the image of quadrilateral A under the matrix **N**

Find the matrix **N**

$\mathbf{N} = \begin{pmatrix} & \\ & \end{pmatrix}$

(Total for Question 17 is 4 marks)

18



A B

Diagram **NOT** accurately drawn

The diagram shows two mathematically similar solids **A** and **B**

The volume of solid **A** is 1125 cm^3
The volume of solid **B** is 576 cm^3
Given that

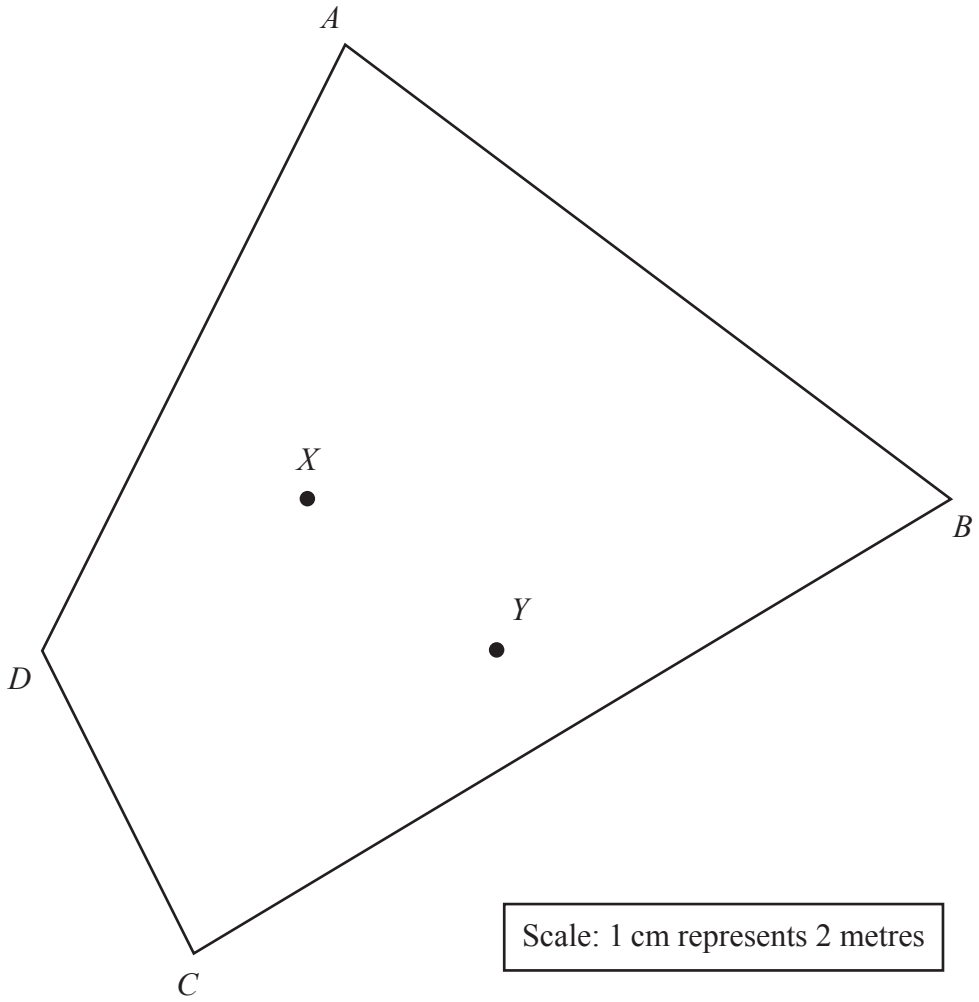
surface area of solid **A** + surface area of solid **B** = 3198 cm^2

calculate the surface area of solid **B**

..... cm^2

(Total for Question 18 is 4 marks)

19



The quadrilateral *ABCD* is a scale drawing of Simon's garden.
There is a tree at the point *X* and a tree at the point *Y*

(a) Construct the locus of all points inside the quadrilateral that are 10 metres from *C*

(1)

(b) Using ruler and compasses only and **showing all your construction lines**, construct the locus of all points inside the quadrilateral that are equidistant from *X* and *Y*

(2)

(c) Construct the locus of all points inside the quadrilateral that are 6 metres from *AB*

(1)

Simon is going to place a light in the garden so that it is closer to *X* than to *Y*, more than 6 metres from *AB* and more than 10 metres from *C*

(d) Show, by shading, the region where Simon can place the light.
Label the region **R**

(1)

(Total for Question 19 is 5 marks)

20 Sarah records the number of visits to the cinema that each of the 19 students in her class made in June. The table below shows her results.

Number of visits to the cinema	Frequency
0	6
1	4
2	5
3	3
4	1

(a) Write down the mode of the number of visits to the cinema.

.....

(1)

(b) Find the median number of visits to the cinema.

.....

(1)

Bhaskor joins Sarah's class.
The mean number of visits to the cinema, after Bhaskor joins the class, for the 20 students in June is 1.7

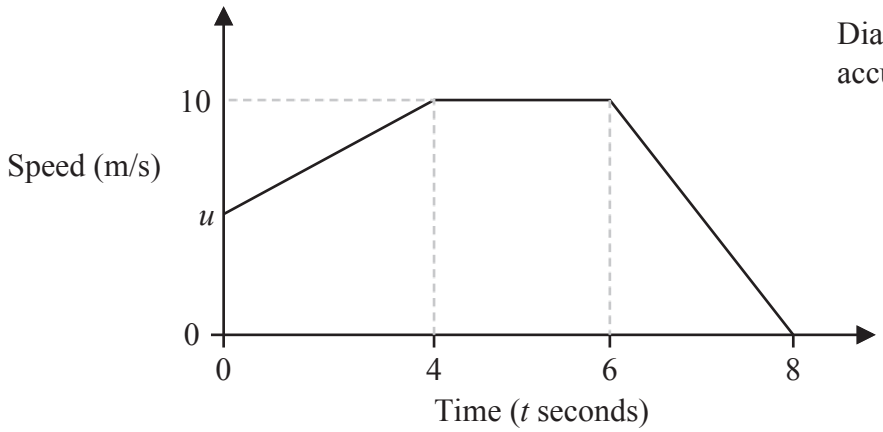
(c) Calculate the number of visits to the cinema Bhaskor makes in June.

.....

(3)

(Total for Question 20 is 5 marks)

21



The diagram shows a sketch of the speed-time graph of part of a cyclist's journey along a straight horizontal road.

(a) Calculate the deceleration, in m/s^2, for the last 2 seconds of this part of the cyclist's journey.

..... m/s^2

(2)

At time $t = 0$ seconds, the speed of the cyclist is u m/s
The cyclist travelled a total distance of 65 m in the 8 seconds.

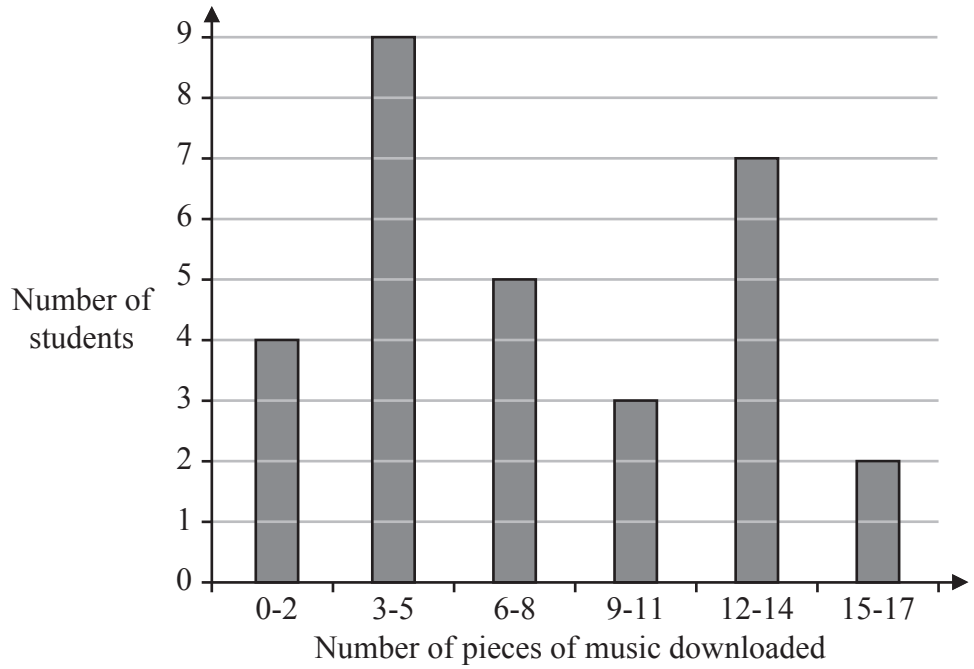
(b) Calculate the value of u

$u =$ .....

(3)

(Total for Question 21 is 5 marks)

22 The bar chart gives information about the number of pieces of music downloaded last month for each of 30 students in a class.



(a) Calculate the percentage of students who downloaded more than 8 pieces of music last month.

..... %

(2)

(b) Calculate an estimate for the mean number of pieces of music each student downloaded last month.

.....

(4)

(Total for Question 22 is 6 marks)

23 Simplify $(x-3)^2 \div \left(\frac{x^2-5x+6}{2}\right) - \left(\frac{x+2}{x^2-4}\right)$

Show your working clearly.

.....

(Total for Question 23 is 5 marks)

24 (a) Use the factor theorem to show that $(x + 1)$ is a factor of $18x^3 - 9x^2 - 17x + 10$

(2)

(b) Factorise fully $18x^3 - 9x^2 - 17x + 10$
Show clear algebraic working.

.....

(4)

(Total for Question 24 is 6 marks)

25 A particle P is moving along a straight line that passes through the point O

The displacement, x metres, of P from O at time t seconds ($t \geqslant 0$) is given by

$$x = -t^3 + 4t^2 + 3t + 1$$

At time t seconds, the velocity of P is v m/s

(a) Find an expression for v in terms of t

$v =$ .....

(2)

The particle P comes to instantaneous rest at the point A

(b) Find, in metres, the distance OA

..... m

(4)

(Total for Question 25 is 6 marks)

26

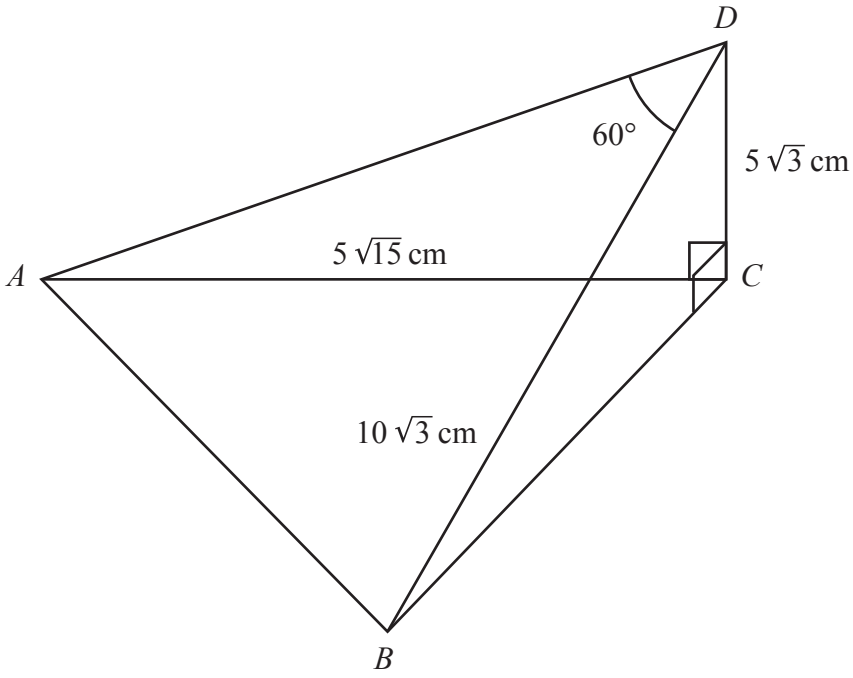


Diagram **NOT** accurately drawn

The diagram shows a pyramid $ABCD$ with a horizontal triangular base ABC

$DC = 5\sqrt{3}$ cm $DB = 10\sqrt{3}$ cm $AC = 5\sqrt{15}$ cm

$\angle ADB = 60°$ $\angle DCA = \angle DCB = 90°$

(a) Calculate the length, in cm to one decimal place, of AB

..... cm

(3)

(b) Calculate the area, in cm^2 to 3 significant figures, of triangle ABC

..... cm^2

(5)

(Total for Question 26 is 8 marks)

TOTAL FOR PAPER IS 100 MARKS

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