Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Wednesday 6 November 2024

Morning (Time: 1 hour 30 minutes)

Paper reference **1MA1/1H**

Mathematics

PAPER 1 (Non-Calculator)

Higher Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB or B pencil, eraser, Formulae Sheet (enclosed). Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **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.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may not be used**.

Information

- The total mark for this paper is 80
- 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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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P 7 5 1 5 8 A 0 1 2 4

Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Work out $818.4 \div 1.2$

.....

(Total for Question 1 is 3 marks)

2 The table shows the probabilities that a biased dice will land on 3, on 4, on 5 and on 6

Number on dice	1	2	3	4	5	6
Probability			0.10	0.30	0.05	0.25

Karim assumes that the probabilities that the dice will land on 1 and on 2 are the same.

Karim rolls the biased dice 500 times.

(a) Assuming Karim is right, work out an estimate for the number of times the dice will land on 2

.....

(3)

Karim is wrong.
The probability that the dice will land on 2 is greater than the probability that the dice will land on 1

(b) How does this information affect your answer to part (a)?

.....

.....

.....

(1)

(Total for Question 2 is 4 marks)

3 (a) Work out $3\frac{1}{2} - 1\frac{1}{6}$

Give your answer as a mixed number.

.....

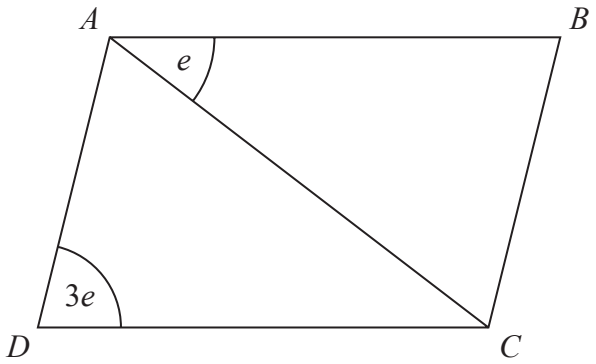
(2)

(b) Show that $5\frac{1}{4} \div 2\frac{1}{3} = 2\frac{1}{4}$

(3)

(Total for Question 3 is 5 marks)

4 *ABCD* is a parallelogram.



All angles are measured in degrees.

Find an expression, in terms of e, for the size of angle CAD.
Give a reason for each stage of your working.

(Total for Question 4 is 3 marks)

5 A car travelled 4.96 miles at an average speed of 30.4 miles per hour.

(a) Work out an estimate for the time taken by the car.
Give your answer in minutes.

..... minutes
(3)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

.....

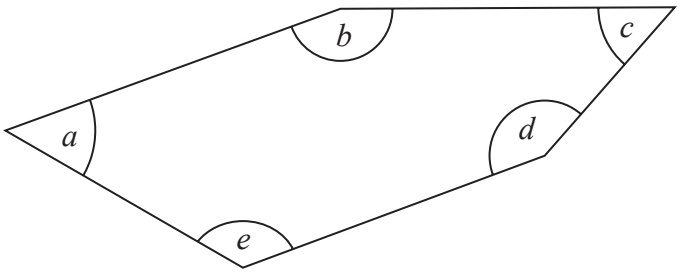
.....

.....

(1)

(Total for Question 5 is 4 marks)

6 Here is a pentagon.



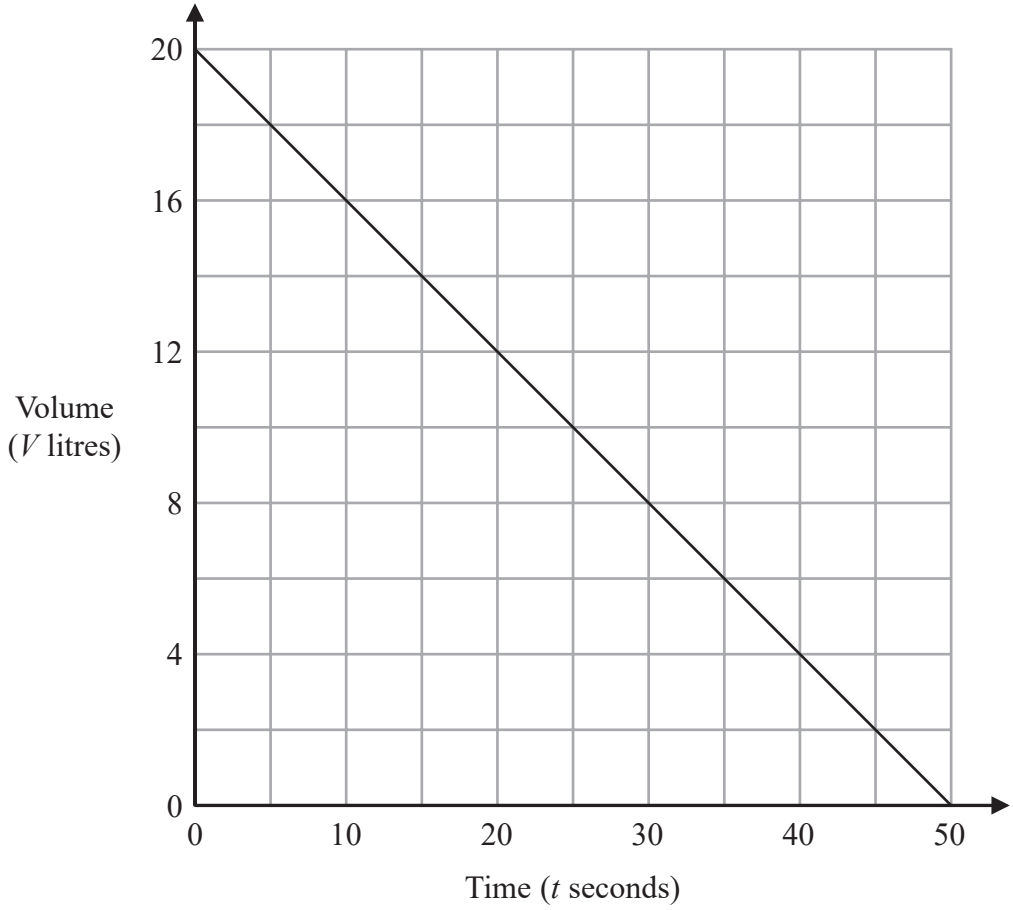
Angle a = angle c
Angle b = 155°
Angle d is three times the size of angle c
Angle e is two times the size of angle c

Work out the size of angle a

.....°

(Total for Question 6 is 4 marks)

7 The graph shows the volume of water, V litres, in a tank at time t seconds.



What does the gradient of this graph represent?

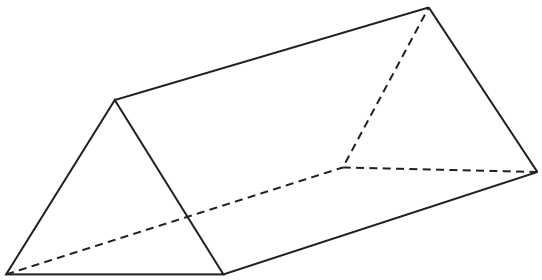
.....

.....

.....

(Total for Question 7 is 1 mark)

8 The diagram shows a solid triangular prism on a horizontal floor.



$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The face in contact with the floor is a rectangle of width 2 m.

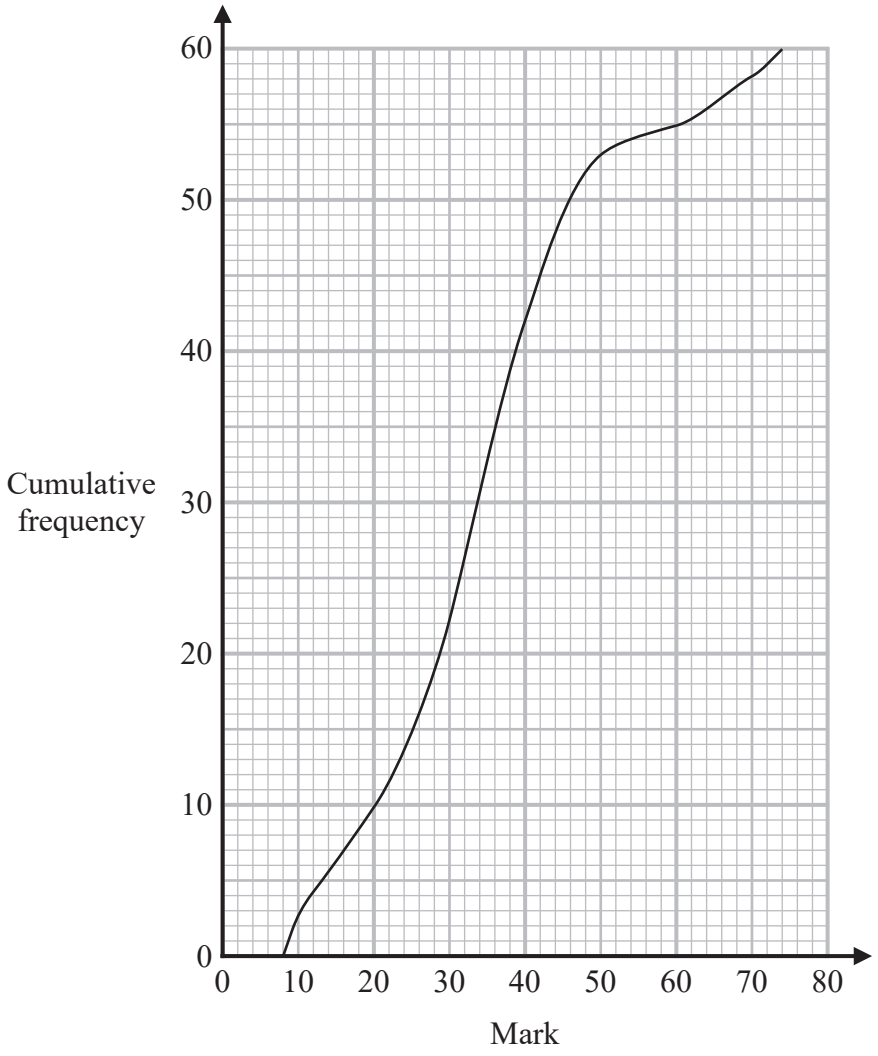
The pressure on the floor due to the prism is 80 newtons/m^2
The force exerted by the prism on the floor is 720 newtons.

Work out the length of the prism.

..... m

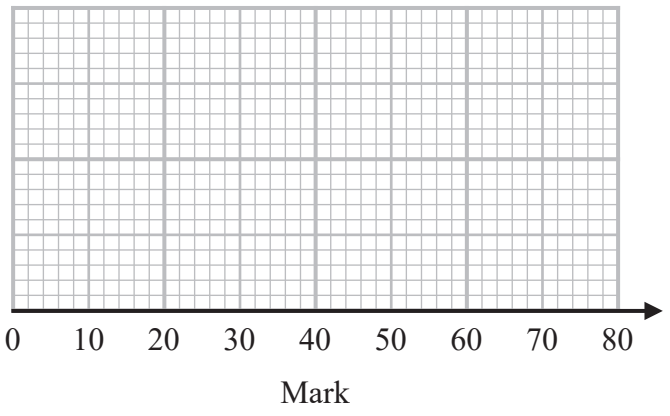
(Total for Question 8 is 3 marks)

9 The cumulative frequency graph gives information about the marks that 60 students got in a test.



For these 60 students
the highest mark was 74
the lowest mark was 8

(a) On the grid below, draw a box plot for the distribution of the marks.



(3)

The pass mark for the test was 40

Sian says,

"30% of the 60 students passed the test."

(b) Is Sian correct?
You must show how you get your answer.

(3)

(Total for Question 9 is 6 marks)

10 (a) Work out $25^{\frac{1}{2}} \times 8^{\frac{1}{3}}$

.....

(2)

(b) Find the value of $\left(\frac{1}{32}\right)^{\frac{3}{5}}$

.....

(2)

(Total for Question 10 is 4 marks)

11 Kate was asked to factorise $x^2 + 5x + 6$ in the form $(x + a)(x + b)$

Kate says,

"The sum of a and b must be 6 and the product of a and b must be 5"

(a) Explain what is wrong with Kate's statement.

.....

.....

.....

(1)

(b) Factorise fully $2m^2 - 2$

.....

(2)

(c) Factorise fully $ax + bx - ay - by$

.....

(2)

(Total for Question 11 is 5 marks)

12 **A**, **B** and **C** are three solid spheres.

Sphere **A** has a volume of $64\,cm^3$
Sphere **B** has a volume of $125\,cm^3$

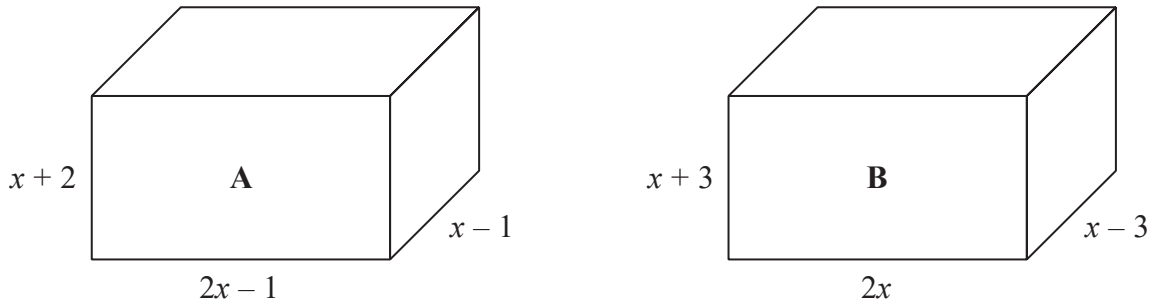
The radius of sphere **C** is 50% of the radius of sphere **B**.

Work out the ratio of the surface area of sphere **A** to the surface area of sphere **C**.
Give your answer in the form $a : b$ where a and b are integers.

.....

(Total for Question 12 is 4 marks)

13 Here are two cuboids.



All lengths are measured in centimetres.

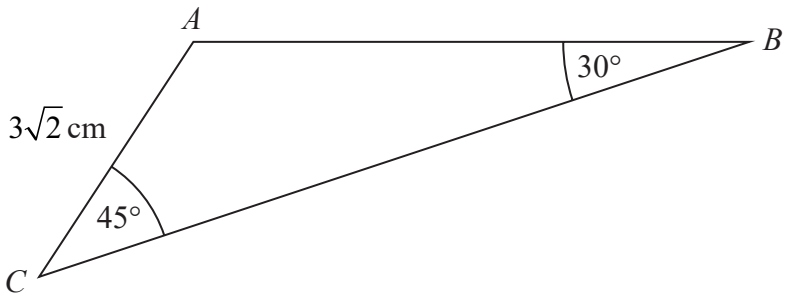
The volume of cuboid **A** is 142 cm^3 greater than the volume of cuboid **B**.

Work out the value of x.

$x =$ .....

(Total for Question 13 is 5 marks)

14 ABC is a triangle.

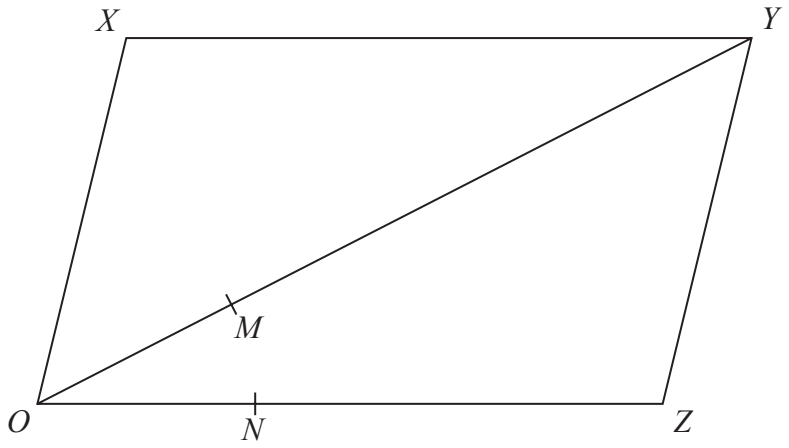


Work out the length of AB.

..... cm

(Total for Question 14 is 3 marks)

15 $OXYZ$ is a parallelogram.



$\overrightarrow{OY}$ = **a** and $\overrightarrow{OZ}$ = **b**

M is the point on OY such that $OM : MY = 1 : 3$
N is the point on OZ such that $ON : NZ = 1 : 2$

Work out the ratio $XN : MN$
You must show all your working.

.....

(Total for Question 15 is 4 marks)

16 (a) Rationalise the denominator of $\frac{15}{\sqrt{5}}$

Give your answer in its simplest form.

.....

(2)

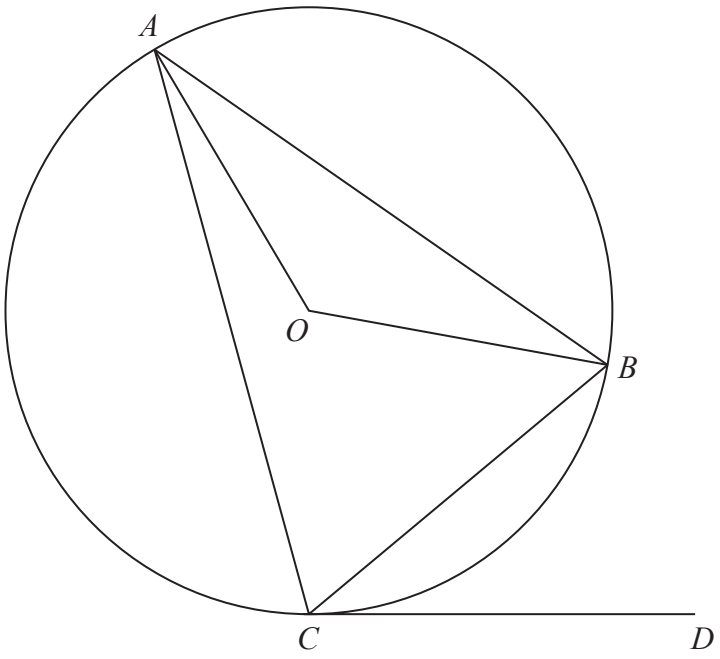
(b) Write $\frac{\sqrt{75}-2}{1+2\sqrt{3}}$ in the form $\frac{a-b\sqrt{3}}{c}$ where a, b and c are integers.

.....

(4)

(Total for Question 16 is 6 marks)

17 A, B and C are points on a circle, centre O.



CD is a tangent to the circle.

Angle $BCD = 40°$
Angle $OAB = 3 \times$ angle OAC

Work out the size of angle ACD.
Write down any circle theorems that you use.

°

(Total for Question 17 is 4 marks)

18 $f(x) = \dfrac{5x - 3}{4}$

(a) Find $f^{-1}(x)$

$f^{-1}(x) =$ .....

(2)

For all values of x

$$g(x) = (x - 1)^2 \text{ and } h(x) = 1 - 2x$$

(b) Work out the value of gh(5)

$gh(5) =$ .....

(2)

(Total for Question 18 is 4 marks)

19 In the semi-finals of a chess tournament,
player **A** will play player **B**
and player **C** will play player **D**.

The two winners will then play each other in the final.

The probability that player **A** will win against player **B** is 0.6
The probability that player **A** will win against player **C** is 0.5
The probability that player **A** will win against player **D** is 0.3
The probability that player **C** will win against player **D** is 0.2

Work out the probability that player **A** will win the chess tournament.

.....

(Total for Question 19 is 4 marks)

20 **C** is the circle with equation $x^2 + y^2 = 4$

Find an equation of the tangent to **C** at the point $(p, 1)$ where $p > 0$
Give your answer in the form $y + \sqrt{a}x = b$ where a and b are integers.
You must show all your working.

.....

(Total for Question 20 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS

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