Candidate surname	Other names

Maths Planner

AQA

2024 Predicted Paper

Mathematics

PAPER 2 (Calculator)

Higher Tier

Time 1 hour 30 minutes

Caution: These topics are not guaranteed to show up, please focus on all topic areas. They have been selected using analysis on previous official exam papers.

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Total Marks

82

Q	Topic(s)	Marks
1	Expand and Simplify	/ 3
2	Similar Shapes	/ 2
3	Primes, Cubes and Triangular Numbers	/ 2
4	Reverse Percentages	/ 2
5	Angles in Parallel Lines	/ 2
6	Ratio 1:n / Sharing	/ 4
7	Calculating with Speed	/ 4
8	Standard Form	/ 3
9	Combining Ratio / Fractions	/ 3
10	Types of Graphs	/ 3
11	Algebraic Fractions	/ 1
12	Angles in Polygons	/ 3
13	Product Rule for Counting	/ 2

Q	Topic(s)	Marks
14	Compound / Simple Interest	/ 4
15	Equation of a Straight Line	/ 5
16	Averages from a Table	/ 4
17	Trigonometry	/ 4
18	Quadratic Equations	/ 5
19	Iteration	/ 4
20	Volume / MDV / Bounds	/ 4
21	Direct / Inverse Proportion	/ 5
22	Histograms	/ 3
23	Non-Right Trigonometry	/ 5
24	Trig Graphs / Functions	/ 5

Maths Planner

Student Warning

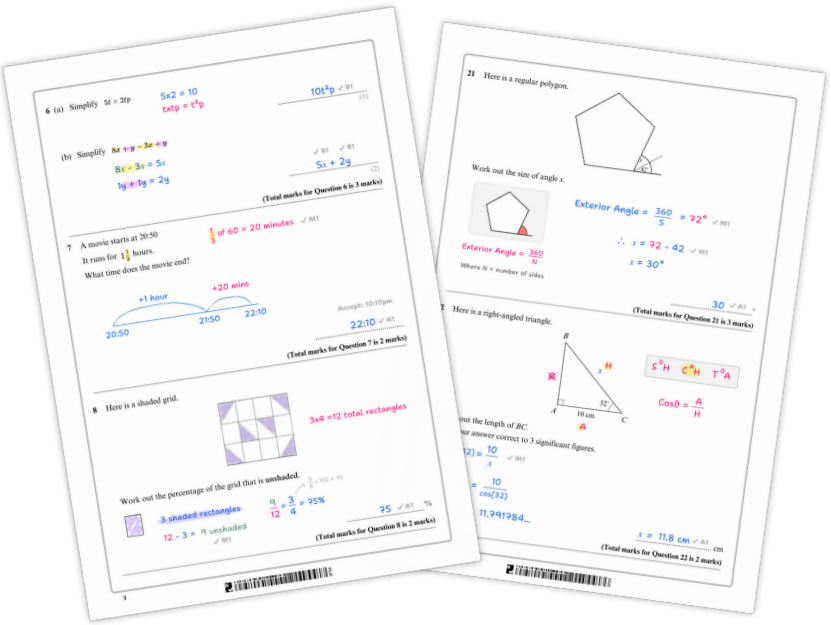
The questions in this paper will not be in the exam

These topics are **not guaranteed** to show up in your Paper 2 exam. Please make sure to revise **all topic areas**, especially since topics covered in Paper 1 can still come up.

These questions have been selected using analysis on previous official exam papers.

Worked Solutions

SCAN ME



Answers all questions in the spaces provided.

Do not write outside the box

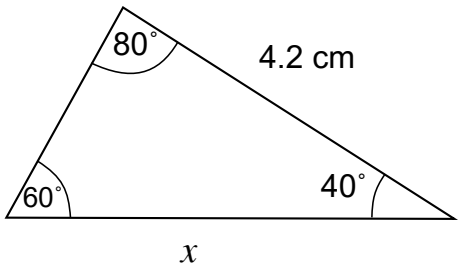
1 Expand and simplify $3(2y + x) - 5(x - y)$

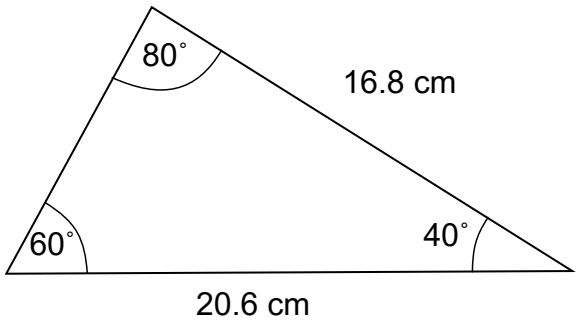
[3 marks]

Answer _____

2 Here are two scalene triangles.

Not drawn accurately





Work out the size of length x.

[2 marks]

Answer x = _____ cm

Do not write outside the box

3 Sam is thinking of a single digit integer, which is **both** prime and triangular.

Work out the value of this integer cubed.

[2 marks]

Answer _____

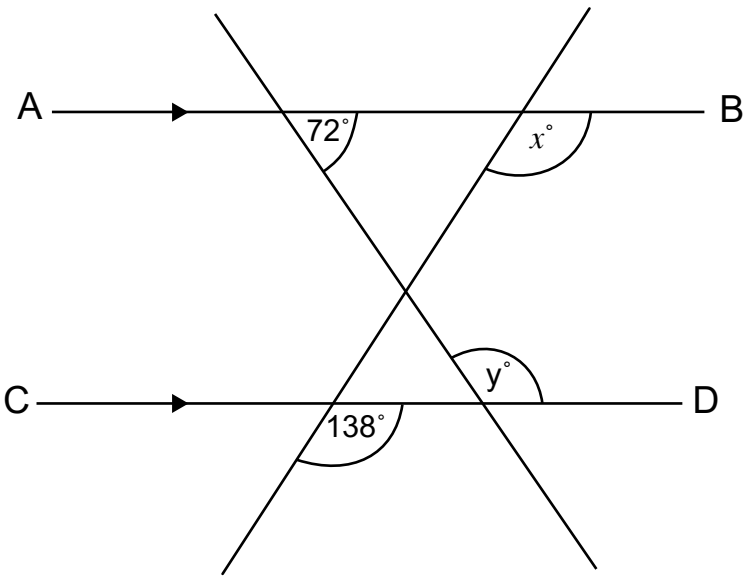
4 A gaming PC has a **discount** of 25%.
The discount price is £2062.50
Work out the original price before the sale.

[2 marks]

Answer £ _____

Do not write outside the box

5 AB and BC are parallel lines.



Not drawn accurately

5 (a) Work out the size of angle x.

[1 mark]

Answer _____ °

5 (b) Work out the size of angle y.

[1 mark]

Answer _____ °

Do not write outside the box

6 (a) Write 8 : 12 in the form 1 : *n*

[1 mark]

Answer _____

6 (b) Tony and Sarah have money saved in the ratio 7 : 11

Sarah has saved £24 more than Tony.

Work out how much they have saved in total.

[3 marks]

Answer £ _____

Do not write outside the box

7 Josh is competing in a 20 mile race.
He must **run the first half** and then cycle the remaining half.

After **24 minutes**, Josh looks at his fitness watch and reads he has ran **1.8 miles**.

He continues this pace until he reaches the half way point.

Work out exactly how long the first half of the race takes Josh to complete.
Give your answer in, hours, minutes and seconds.

[4 marks]

Answer _____hrs _____mins _____secs

Do not write outside the box

8 (a) Write 7.5×10^{-6} as an ordinary number.

[1 mark]

Answer _____

8 (b) Work out $(3.92 \times 10^{8}) \div (1.4 \times 10^{2})$

Give your answer in standard form.

[2 marks]

Answer _____

9 Given $x : y = 4 : 5$ and $\frac{x}{w} = \frac{7}{3}$

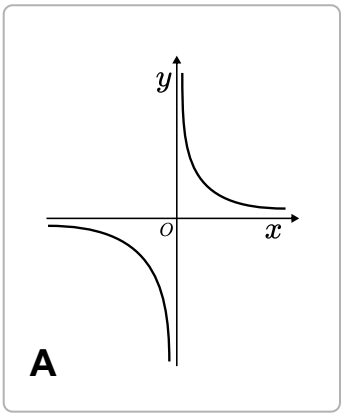
find the ratio $x : y : w$ in its simplest form.

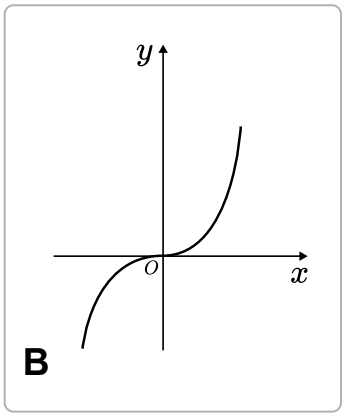
[3 marks]

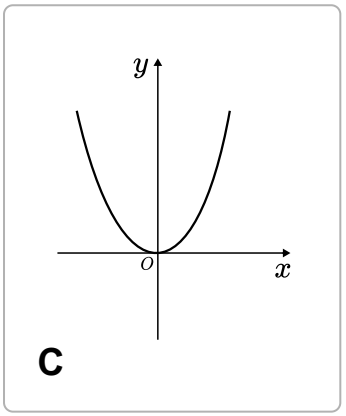
Answer _____

Do not write outside the box

10 Here are some graphs.







Write down an equation for each graph.

[3 marks]

Answer

A _____

B _____

C _____

11 Simplify $\dfrac{x^2 - 16}{x^2 - 4x - 32}$

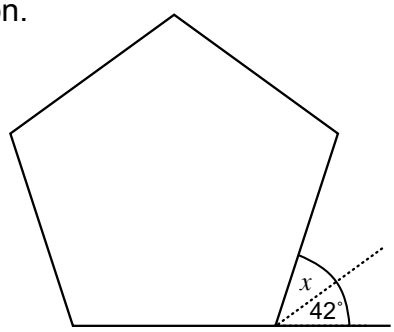
Circle the correct answer.

[1 mark]

$-\dfrac{16}{4x + 32}$ $\quad$ $\dfrac{x - 4}{x - 8}$ $\quad$ $\dfrac{4}{x - 8}$ $\quad$ $\dfrac{x + 4}{x + 8}$

Do not write outside the box

12 Here is a regular polygon.



Not drawn accurately

Work out the size of angle x.

[3 marks]

Answer _____ °

13 There are 21 teams in a youth football league.
During a season, each team will play each other **once**.
8 of the matches were cancelled.
Work out the total games that were played.

[2 marks]

Answer _____

Do not write outside the box

14 Joanne wants to invest **£3800** into a high interest savings account.

These are the two banks she is considering.

Zupa Bank	**Sterling Bank**
Compound Interest Rates:	Simple Interest Rates:
6% for the **first** 6 months 3.2% thereafter	3.8% per annum

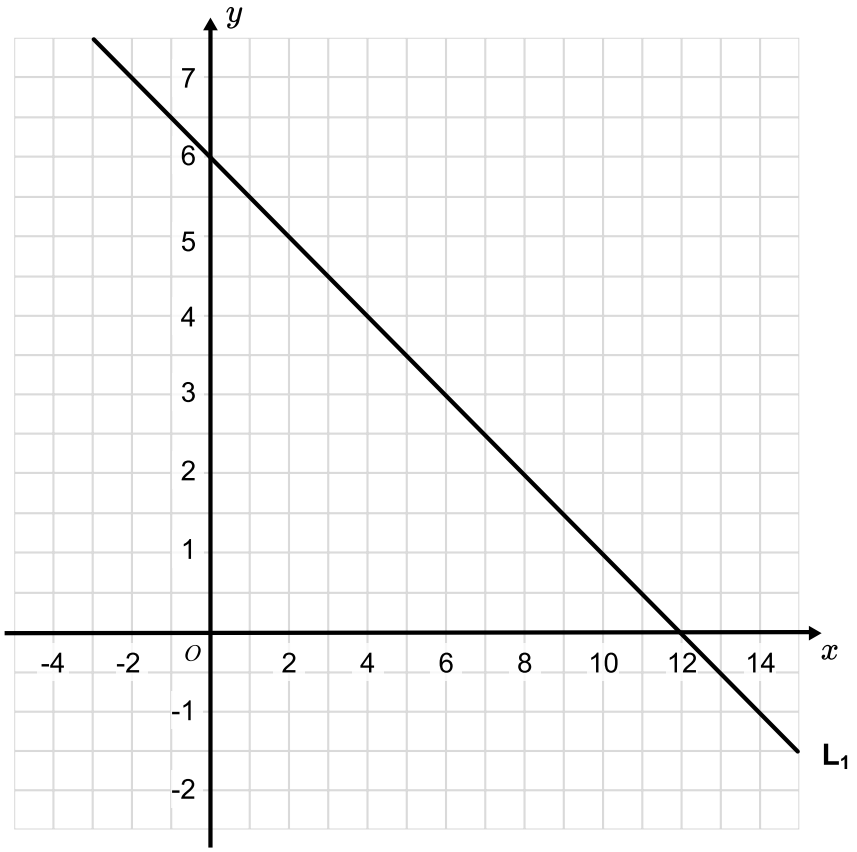
Work out the difference in interest Joanne would earn between the two banks after **4 years**.

[4 marks]

Answer £ _____

Do not write outside the box

15 The line L_1 is shown on the grid.



15 (a) Write down the equation of the line L_1 in the form $y = mx + c$

[2 marks]

Answer _____

15 (b) The line L_2 is perpendicular to L_1 , and passes through the point (0, -1)

Write down the equation for the line L_2 in the form $y = mx + c$

[3 marks]

_____

_____

_____

Answer _____

Do not write outside the box

16 The frequency table gives information about the number of goals scored by a player.

Number of goals	Frequency	
0	13	
1	17	
2	6	
3	x	
4	13	

The **mean** number of goals scored is 2.

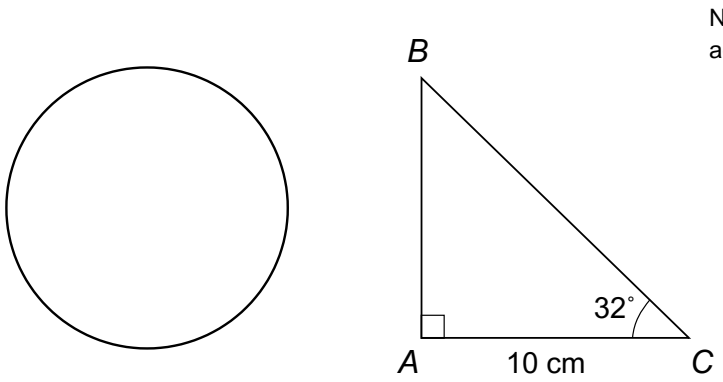
Work out the value of x

[4 marks]

Answer _____

Do not write outside the box

17 Here is a circle and right angled triangle *ABC.*



The **circumference** of the circle is 12π cm

Work out if the triangle will fit inside the circle.

You must show full workings and justify your answer.

[4 marks]

Do not write outside the box

18 The equation of a quadratic curve is given by $2x^2 + 9 = 4x^2 - 4x$

(a) Work out the coordinates of the curves *y*–intercept.

[2 marks]

Answer _____

18 **(b)** Solve the quadratic equation.
Give your answers correct to 2 decimal places.

[3 marks]

Answer _____

Do not write outside the box

19 (a) Starting with $x_0 = 1$, use the iteration formula $x_{n+1} = \sqrt[3]{4x^2 + 8}$ to find the values of x_1, x_2 and x_3

[3 marks]

$x_1 =$ _____

$x_2 =$ _____

$x_3 =$ _____

19 (b) The values of x_1, x_2 and x_3 are solutions of an equation in the form $x^3 + ax + b = 0$ where *a* and *b* are integers.

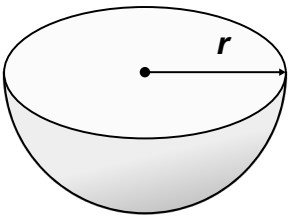
Find the value of *a* and *b.*

[1 mark]

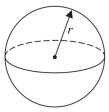
a = _____ *b* = _____

Do not write outside the box

20 Shown is a hemisphere.



Volume of a sphere $= \frac{4}{3}\pi r^3$



r = 4.8 cm correct to 2 signifiant figures.

The hemisphere has a mass of 8kg correct to the nearest kilogram.

Work out the hemisphere's **maximum** density, in grams per cubic centimetre.

[4 marks]

Answer _____ g/cm³

Do not write outside the box

21 (a) **a** is inversely proportional to **b**.

Complete the table of values.

[2 marks]

a		2	90
b	4	15	

21 (b) **b** is directly proportional to the square root of **c**.

When **c** = 16, **b** = **10**

Find a formula for **c** in terms of **a**.

[3 marks]

Answer _____

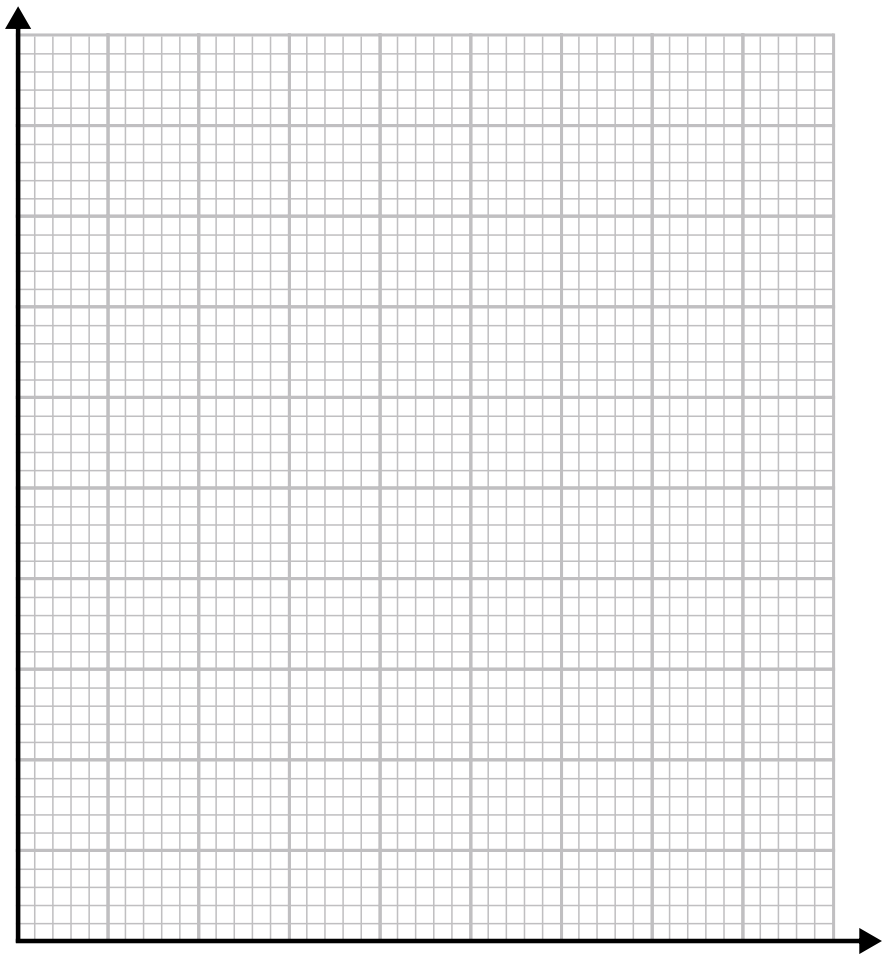
Do not write outside the box

22 The weights, in kilograms, of packages in a warehouse are shown in the table below.

Weight (w kg)	Frequency
$20 < w \leqslant 30$	18
$30 < w \leqslant 35$	23
$35 < w \leqslant 50$	24
$50 < w \leqslant 60$	8

On the grid, draw a histogram for this information

[3 marks]

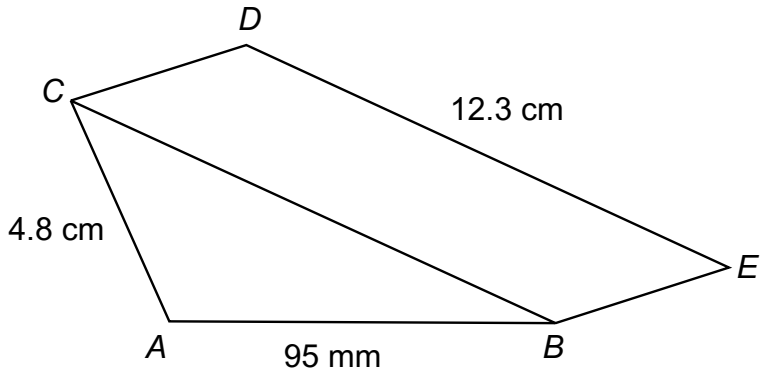


Weight (kg)

Do not write outside the box

23 The cross-section of this prism is a scalene triangle.

Not drawn accurately



$AB : BE = 2 : 1$

Work out the **volume** of this prism.

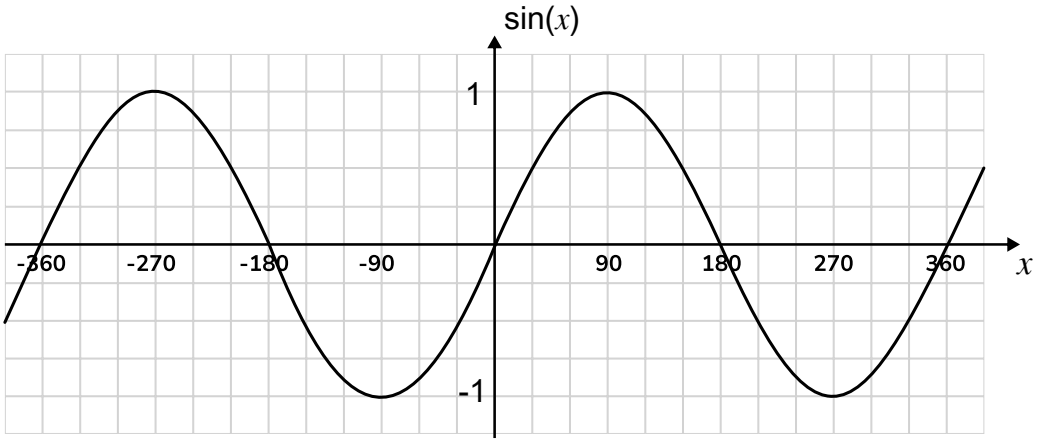
Give your answer correct to 1 decimal place.

[5 marks]

Answer _____ cm^3

Do not write outside the box

24 The function $f(x) = \sin(x)$ is shown on the graph below.



24 (a) Using the graph above

Solve the equation $\sin(x) = 0.5$ for all values of x between $-360^\circ \leq x \leq 360^\circ$

[2 marks]

Answer _____

24 (b) $g(x) = \tan(x)$

Solve $f(45) = g^{-1}(x)$

Give your answer correct to 2 significant figures.

[3 marks]

Answer $x =$ _____

END OF QUESTIONS