Candidate surname	Other names

Maths Planner

AQA

2024 Practice Paper

Mathematics

PAPER 3 (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

85

Q	Topic(s)	Marks
1	Types of Numbers	/ 3
2	Relate Ratio to Fraction & Percentage	/ 2
3	Laws of Indices	/ 7
4	Percentage Increase / Decrease	/ 2
5	Sequences	/ 2
6	Standard Form	/ 4
7	HCF	/ 3
8	Volume of 3D Shapes	/ 3
9	Bearings	/ 2
10	Product Rule for Counting	/ 2
11	Mass, Density & Volume	/ 4
12	Similar Volumes	/ 3
13	Speed with Bounds	/ 4

Q	Topic(s)	Marks
14	Cumulative Frequency Curves	/ 4
15	Probability Trees	/ 5
16	3D Trigonometry & Pythagoras	/ 4
17	Parallel & Perpendicular Lines	/ 4
18	Histograms	/ 3
19	Algebraic Venn Diagram / Probability	/ 4
20	Polygons / Non-right-angled Area	/ 3
21	Ratio Equations	/ 4
22	Complete the Square / Graph Transformations	/ 5
23	Sine & Cosine	/ 4
24	Functions	/ 4

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Student Warning

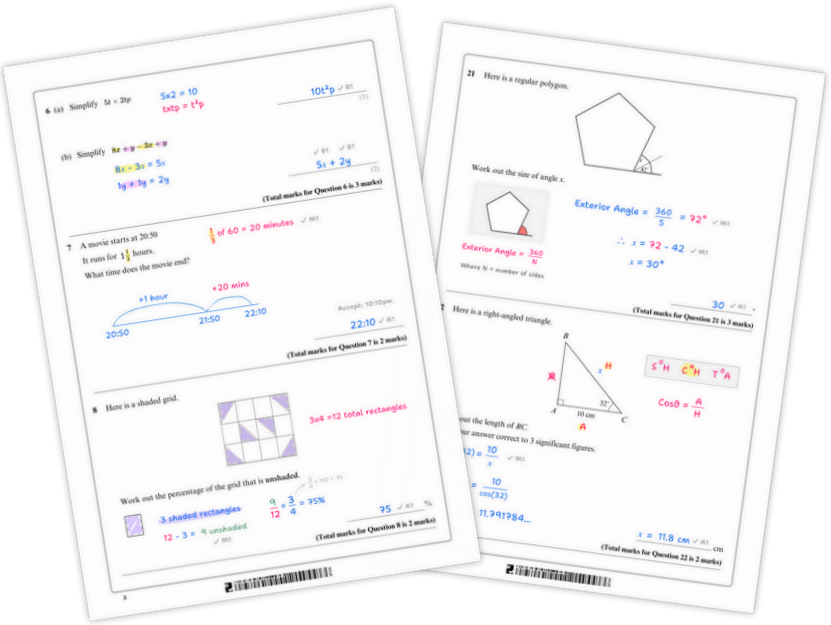
The questions in this paper will not be in the exam

These topics are **not guaranteed** to show up in your Paper 3 exam. Please make sure to revise **all topic areas**, especially since topics covered in Paper 1 and Paper 2 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 Match the numbers to the correct description. **[3 marks]**

Prime	9
Square	15
Cube	2
Triangular	120
	104
	125

2 In a classroom, the ratio of boys to girls is 3 : 5

In the same classroom,
the ratio of students who prefer science to those who prefer art is 7 : 3

2 (a) Write the fraction of students who are boys. **[1 mark]**

Answer _____

2 (b) Write the percentage of students who prefer art. **[1 mark]**

Answer _____ %

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Do not write outside the box

3 (a) Simplify $a^2 \times a \times a^{-5}$

[2 marks]

Answer _____

3 (b) Simplify $\dfrac{(4wc^3)^3}{8wc}$

[3 marks]

_____

_____

_____

Answer _____

3 (c) Write $32^{\frac{1}{2}}$ as a single power of 2.

[2 marks]

_____

_____

_____

Answer _____

Do not write outside the box

4 A number was increased by 8% followed by a decrease of 5%.
Work out the overall percentage change of the number.

[2 marks]

Answer _____ %

5 Here are the first five terms of a sequence.

−8 −13 −18 −23 −28

Work out an expression for the *n*th term of the sequence.

[2 marks]

Answer _____

Do not write outside the box

6 (a) Write 5×10^{-5} as an ordinary number.

[1 mark]

Answer _____

6 (b) Write 830×10^{6} in standard form.

[1 mark]

Answer _____

6 (c) Work out $5.1 \times 10^{5} - 3.1 \times 10^{3}$

Give your answer in standard form.

[2 marks]

Answer _____

Do not write outside the box

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

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

7 (a) Write down the number that A represents.

[1 mark]

Answer _____

7 (b) Find the Highest Common Factor (HCF) of 2*A* and *B*.

[2 marks]

_____

_____

_____

_____

_____

Answer _____

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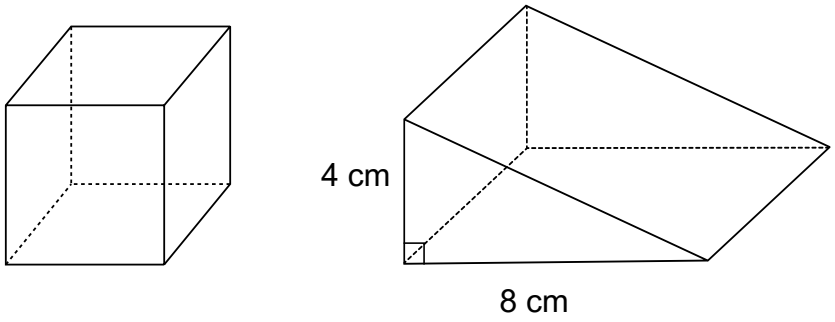
Do not write outside the box

8 Here is a cube and triangular prism.



The length of the triangular prism is a **single digit** odd number with 3 factors.

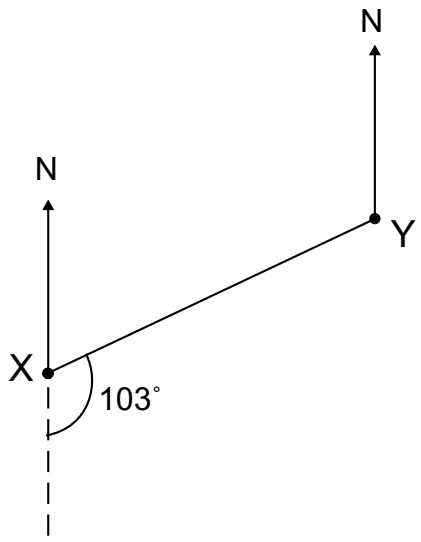
The volume of the cube is equal to the volume of the triangular prism.
Work out the side length of the cube.
Give your answer correct to 2 decimal places.

[3 marks]

Answer _____

Do not write outside the box

9 The diagram below shows the positions of two lighthouses X and Y.



Not drawn accurately

Work out bearing of lighthouse X from lighthouse Y.

[2 marks]

Answer _____ °

10 Emma is organising a music playlist.
She wants to create a playlist with one song from each genre.

There are

5 pop songs 6 rock songs 4 jazz songs

Calculate the number of different ways Emma can choose one pop song, one rock song, and one jazz song for her playlist.

[2 marks]

_____

_____

_____

Answer _____

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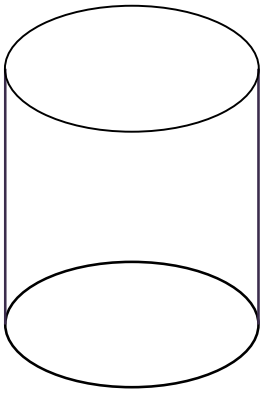
Do not write outside the box

11 The diagram shows a cylinder placed on a horizontal floor.



Not drawn accurately

The radius and height of a cylinder are in the ratio 1:4.

The cylinder has a mass of 35kg.

Work out the density of the cylinder, in grams per cubic metres.
Give your answer correct to 1 decimal place.

[4 marks]

Answer _____ g/m³

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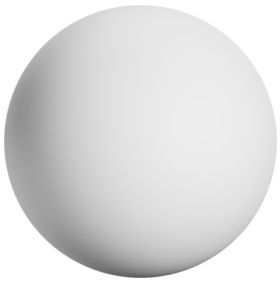
Do not write outside the box

12 Shown below are two strongman atlas lifting stones, they are **not** spheres.

Stone A



Stone B

Stone **A** has a diameter 60 cm

Stone **B** has a diameter of 80 cm and a volume of 6702 cm³

Work out the volume of Stone **A**

Give your answer to the nearest integer.

[3 marks]

Answer _____ cm³

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Do not write outside the box

13 A car travels a distance of 150 km.
The distance is measured to the nearest 5 km.
The time taken for the journey is 2 hours, measured to the nearest 10 minutes.

Calculate the maximum average speed that car could have travelled.

[4 marks]

Answer _____ km/h

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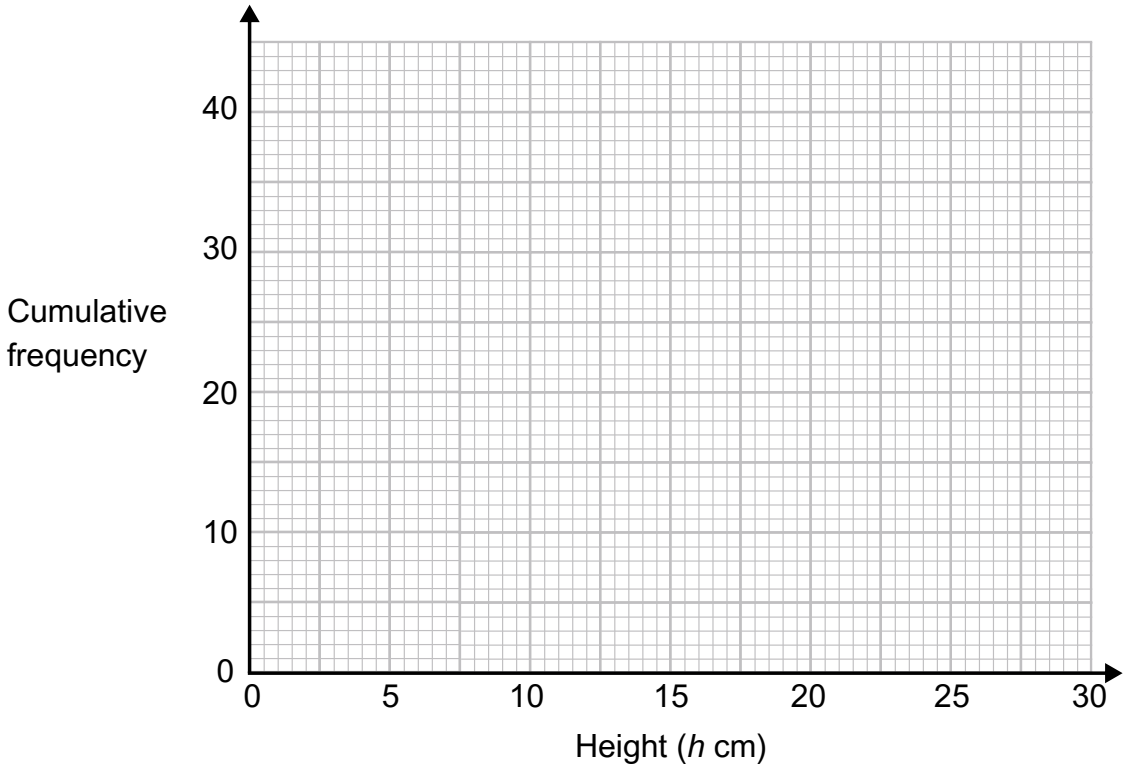
Do not write outside the box

14 The cumulative frequency table gives information about the heights, in cm, of 50 plants.

Height (h cm)	Cumulative Frequency
$0 < h \leq 5$	3
$0 < h \leq 10$	7
$0 < h \leq 15$	21
$0 < h \leq 20$	36
$0 < h \leq 25$	40

14 (a) On the grid, draw a cumulative frequency graph for this information.

[2 marks]



14 (b) Use the graph to find an estimate for the interquartile range of the plants.

[2 marks]

Answer _____ cm

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Do not write outside the box

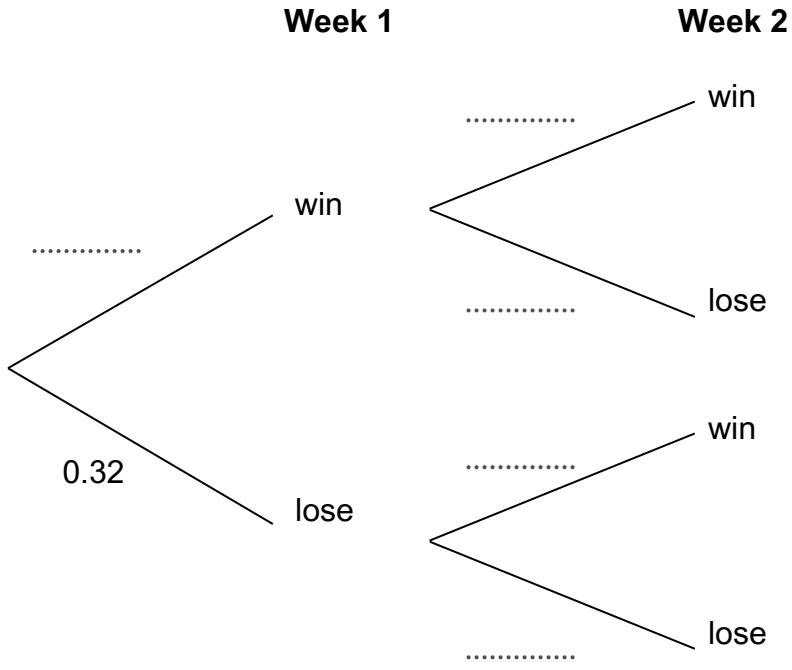
15 A tennis player is playing a game on Week 1 in a tournament and another game on Week 2.

The probability that the player will lose on Week 1 is 0.32

If they win on Week 1, the probability that they will win on Week 2 is 0.83

If they lose on Week 1, the probability that they will win on Week 2 is 0.45

15 (a) Complete the probability tree diagram. **[2 marks]**



15 (b) Estimate the probability that the player will win at least one match. **[3 marks]**

Answer _____

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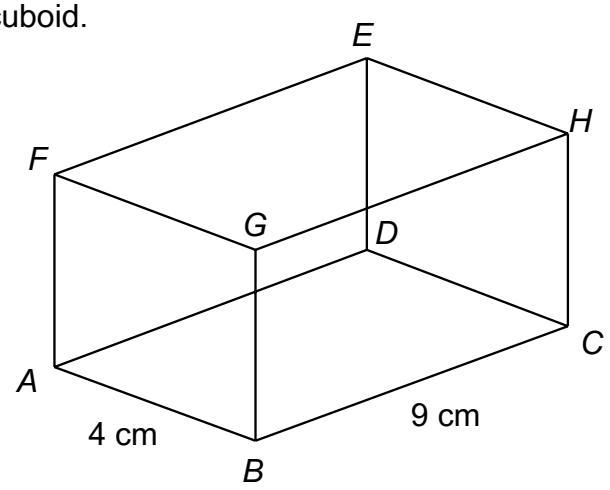
Do not write outside the box

16 *ABCDEFGH* is a cuboid.

Not drawn accurately



The cuboid has a **volume** of 108 cm²

Work out the size of angle *CAH.*

Give your answer correct to 1 decimal place.

[4 marks]

Answer _____ °

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Do not write outside the box

17 The straight line $\mathbf{L_1}$ has the equation $y = -3x + 2$

The straight line $\mathbf{L_2}$ is parallel to $\mathbf{L_1}$ and passes through the point (-4, 8)

The straight line $\mathbf{L_3}$ is perpendicular to to $\mathbf{L_2}$ and passes through the point (1, 3)

The straight line $\mathbf{L_2}$ and $\mathbf{L_3}$ intercept at point A.

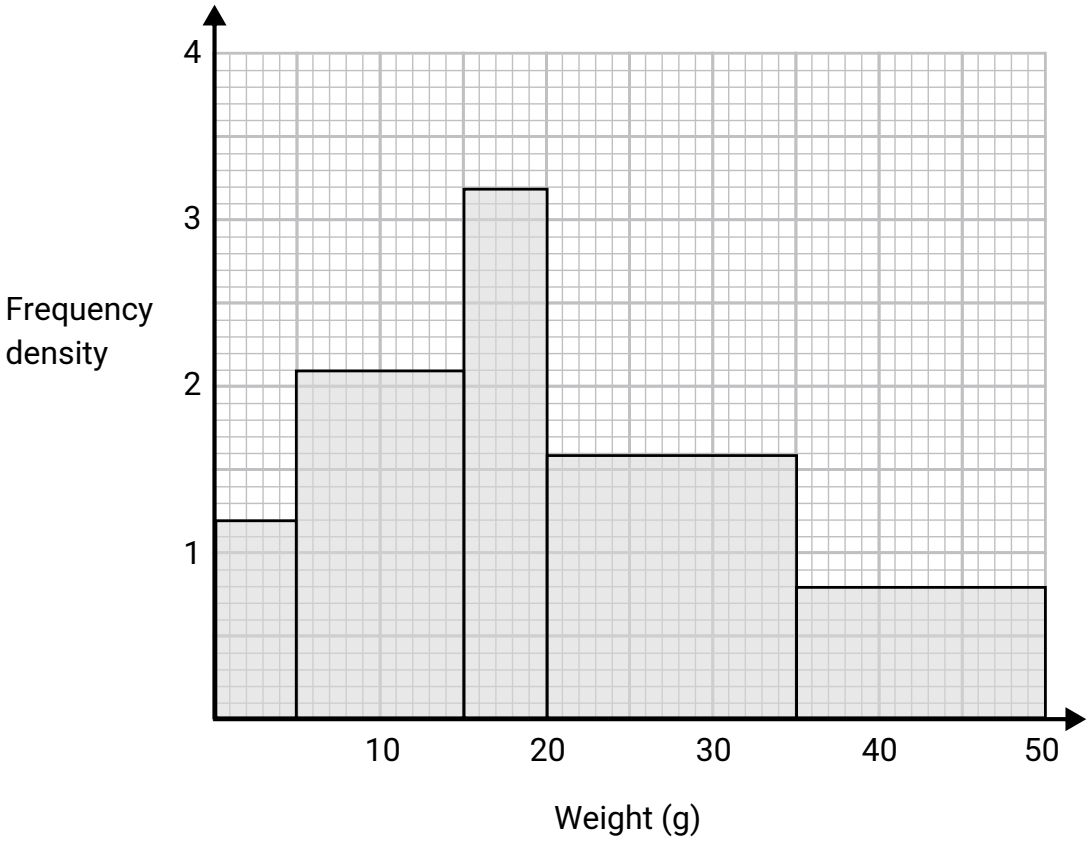
Work out the coordinates of point A.

[4 marks]

Answer _____

Do not write outside the box

18 The histogram shows information about the weights, in grams, of letters taken by a post office during an afternoon.



Work out the percentage of letters that weighed more than 25 grams.
Give your answer to the nearest percent.

[3 marks]

Answer _____ %

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Do not write outside the box

19 45 people were asked if they have travelled to Greece or Portugal.

12 people said they had visited both countries.

9 people had visited neither country.

Twice as many people had visited Greece than Portugal.

Two of these people were picked at random.
Work out the probability that they have both visited Greece.

[4 marks]

Answer _____

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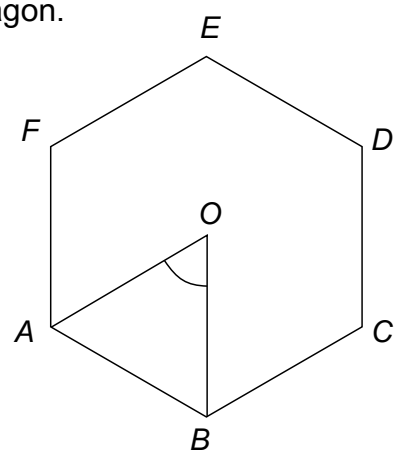
Do not write outside the box

20 Here is a regular hexagon.



$OA = OB = 8$ cm

Work out the area of the hexagon.

Give your answer correct to 3 significant figures. **[3 marks]**

Answer _____ cm^3

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Do not write outside the box

21 Given $5a - 1 : a + 9 = 2a - 3 : a + 7$

Find possible values for *a*.

[4 marks]

Answer _____

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Do not write outside the box

22 (a) $f(x) = x^2 + 5x + 8$

Write $f(x)$ in the form $(x + p)^2 + q$ where *p* and *q* are integers. **[2 marks]**

Answer _____

22 (b) Write down the coordinates for the turning point of the curve $-f(x - 3)$

[3 marks]

Answer _____

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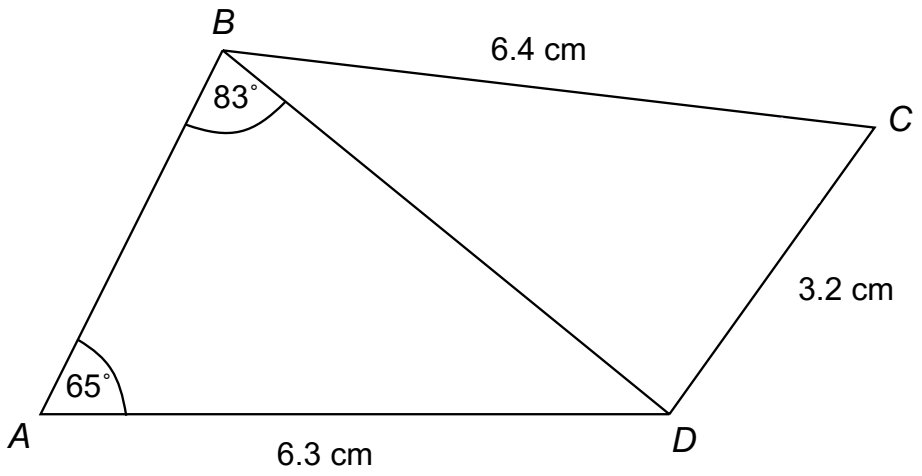
Do not write outside the box

23 *ABCD* is a quadrilateral.

Not drawn accurately



Work out the size of angle *BCD*.
Give your answer correct to 2 significant figures.

[4 marks]

Answer _____ °

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Do not write outside the box

24 f and g are functions such that,

$$f(x) = \frac{4}{\sqrt{x}} \qquad \text{and} \qquad g(x) = 4x + 1$$

Given $h(x) = fg(x)$

Work out the value of $h^{-1}(3)$

Give your answer in exact form. **[4 marks]**

Answer _____

END OF QUESTIONS

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