Candidate surname	Other names

Maths Planner

AQA

2024 Practice Paper

Mathematics

PAPER 3 (Calculator)

Foundation Tier

Time 1 hour 30 minutes

Worked Written Solutions ✓

Total Marks

84

Q	Topic(s)	Marks
1	Place Value	/ 1
2	Simplfying Ratio	/ 1
3	Factors, Multiples & Primes	/ 1
4	Percentages of Amounts	/ 2
5	Inequalities	/ 3
6	Solving Linear Equations / Substitution	/ 3
7	Angles in Trangles / Angle Names	/ 3
8	Algebraic Expressions	/ 2
9	Bank Statements	/ 3
10	Names of Shapes	/ 3
11	Square, Cubes & Triangular Numbers	/ 3
12	Ratio as Fractions & Percentages	/ 2
13	Time Calculations	/ 3
14	Frequency Trees	/ 4
15	Bar Charts	/ 5

Q	Topic(s)	Marks
16	Pie Charts	/ 3
17	Probability / Sharing a Ratio	/ 3
18	Direct Proportion	/ 3
19	Scale Drawings / Bearings	/ 4
20	Calculating with Speed	/ 5
21	Circles	/ 3
22	Mass, Density & Volume	/ 3
23	Percentage Change	/ 3
24	Pythagorus	/ 3
25	HCF / LCM	/ 3
26	Laws of Indices / Factorising	/ 7
27	Probability Trees	/ 5

Maths Planner

Marking Codes

Mark	What does it mean?
M1	**Method mark**. This mark is generally given for an appropriate method in the context of the question. *This mark is given for showing your working and may be awarded even if working is incorrect.*
A1	**Accuracy mark**. This mark is generally given for a correct answer following correct working.
B1	**Working mark**. This mark is usually given when working and the answer cannot easily be separated.
C1	**Communication mark.** This mark is given for explaining your answer or giving a conclusion in context supported by your working
P1	**Process Mark.** This mark is generally given for setting up an appropriate process to find a solution in the context of the question

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.

Answers all questions in the spaces provided.

Do not write outside the box

1 Write down the value of the 7 in 3740 **[1 mark]**

3740
0 0 0
0 0
0

✓ B1 ✓ B1

Answer 700 or seven hundreds

2 Simplify 18 : 81 **[1 mark]**

÷9 ↓ 18 : 81 → 2 : 9 ↓ ÷9

Answer 2 : 9 ✓ B1

3 List all the factors of 36 **[1 mark]**

Factor Pairs:

1 x 36 2 x 18 3 x 12 4 x 9 6 x 6

Answer 1, 2, 3, 4, 6, 9, 12, 18, 36 ✓ B1

4 Find 65% of 48 **[2 marks]**

% Multiplier

65 ÷ 100 = 0.65 ∴ 48 x 0.65 = 31.2

Answer 31.2 ✓ B1

Do not write outside the box

5 Complete these statements with one of the following symbols = ≥ ≤ > <

[3 marks]

	– 3	>	– 4	✓ A1
50÷8=6.25	50 ÷ 8	<	6.31	✓ A1
(-5)x(-5) = 25	(–5)²	=	25	✓ A1

6 (a) Solve $\frac{x}{4} = 5$

[1 mark]

$\frac{x}{4} = 5$ ×4 ↓ ↓ ×4

$x = 20$

Answer x = 20 ✓ B1

6 (b) If $y = 7$

Work out the value of $y^3 - 2y$

[2 marks]

$(7)^3 - 2(7) = 343 - 14$

✓ M1 $= 329$

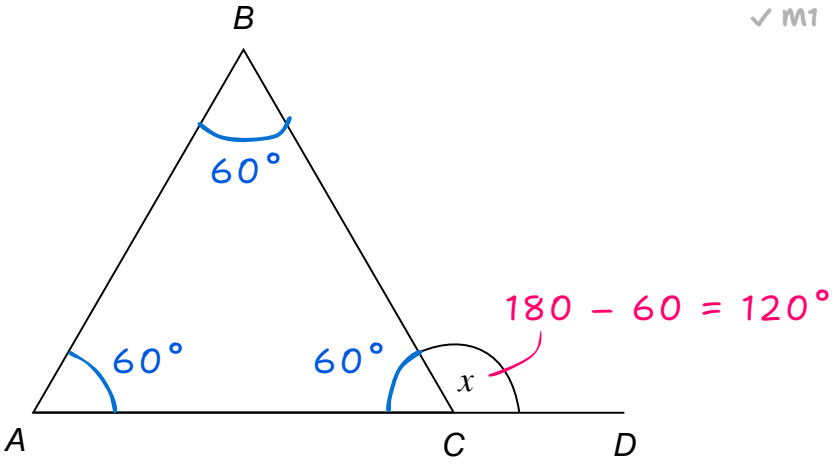
Answer 329 ✓ B1

Do not write outside the box

7 Triangle *ABC* is equilateral.
ACD is a straight line.

Equilateral: All sides & angles are equal.

∴ 180 ÷ 3 = 60° ✓ M1



Angles on a straight line = 180°

7 (a) Write down the value of x.

[2 marks]

Answer 120 ✓ A1 °

7 (b) Write down the mathematical name that describes angle x

[1 mark]

Obtuse Angles > 90° but < 180°

Answer Obtuse ✓ C1

Do not write outside the box

8 (a) Simplify $x \times x \times x$ $x^1 \times x^1 \times x^1 = x^3$ **[1 mark]**

$a^n \times a^m = a^{n+m}$

Answer x^3 ✓ B1

8 (b) Expand $2(3x - 11)$ **[1 mark]**

$2 \times 3x = 6x$ $2 \times (-11) = -22$

Answer $6x - 22$ ✓ B1

9 Complete the bank statement. **[3 marks]**

Credit: Money **going in** to the account

Debit: Money **going out** of the account

Date	Description	Credit (£)	Debit (£)	Balance (£)
01.06.23	Starting Balance			✓ B1 9345.32
04.06.23	Flight tickets		650.00	8695.32
06.06.23	Salary	✓ B1 4180.26		12875.58
10.06.23	Credit card payment		✓ B1 2235.00	10640.58

8695.32 + 650 = £9345.32

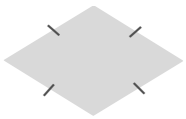
12875.58 - 8695.32 = £4180.26

12875.58 - 10640.58 = £2235

Do not write outside the box

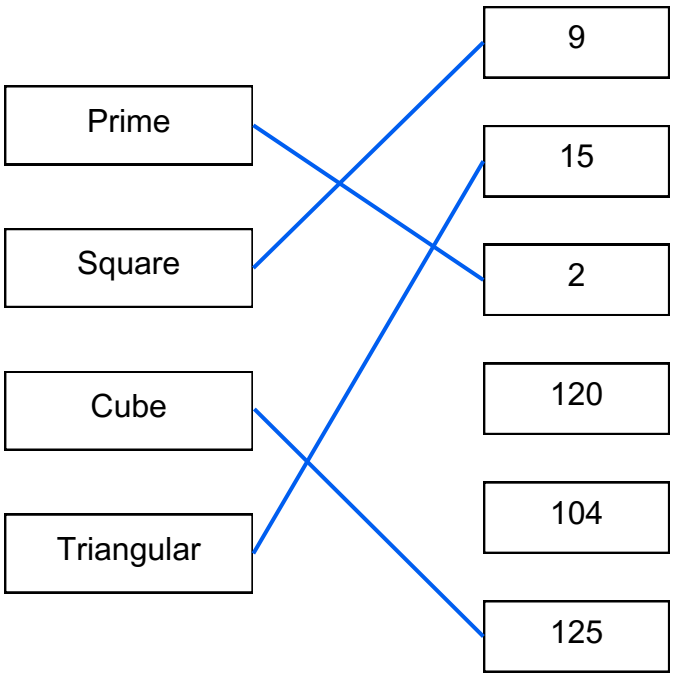
10 Complete the names of these quadrilaterals.

[3 marks]

Shape	Name
	Parallelogram ✓ C1
	Rhombus ✓ C1
	Trapezium ✓ C1

11 Match the numbers to the correct description.

[3 marks]



✓ **B1** (at least 2 correct)
✓ **B2** (at least 3 correct)
✓ **B3** (for all 4 correct)

Do not write outside the box

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

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

B : G Total
3 : 5 8

Answer $\frac{3}{8}$ ✓ B1

In the same classroom

the ratio of students who prefer science to those who prefer art is 7 : 3

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

S : A total
7 : 3 10
x10 ↓ ↓ x10
70 : 30 100%

Answer 30 ✓ B1 %

Do not write outside the box

13 Here is a train timetable.

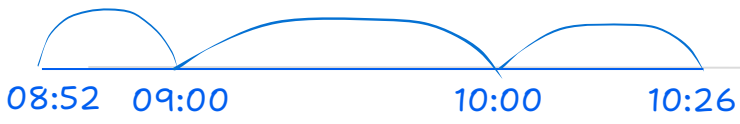
Bristol	08:10	08:45	08:52
Taunton	08:44	09:17	
Exeter	09:15	09:42	
Newton Abbot	09:33		09:58
Plymouth	10:11	10:37	10:26

13 (a) What time does the 09:17 Taunton train arrive at Exeter? **[1 mark]**

Answer 09:42 ✓ B1

13 (b) How long is the 08:52 train from Bristol to Plymouth?
Give your answer in minutes. **[2 marks]**

✓ M1



∴ 8+60+26 = 94 minutes

Answer 94 ✓ A1 minutes

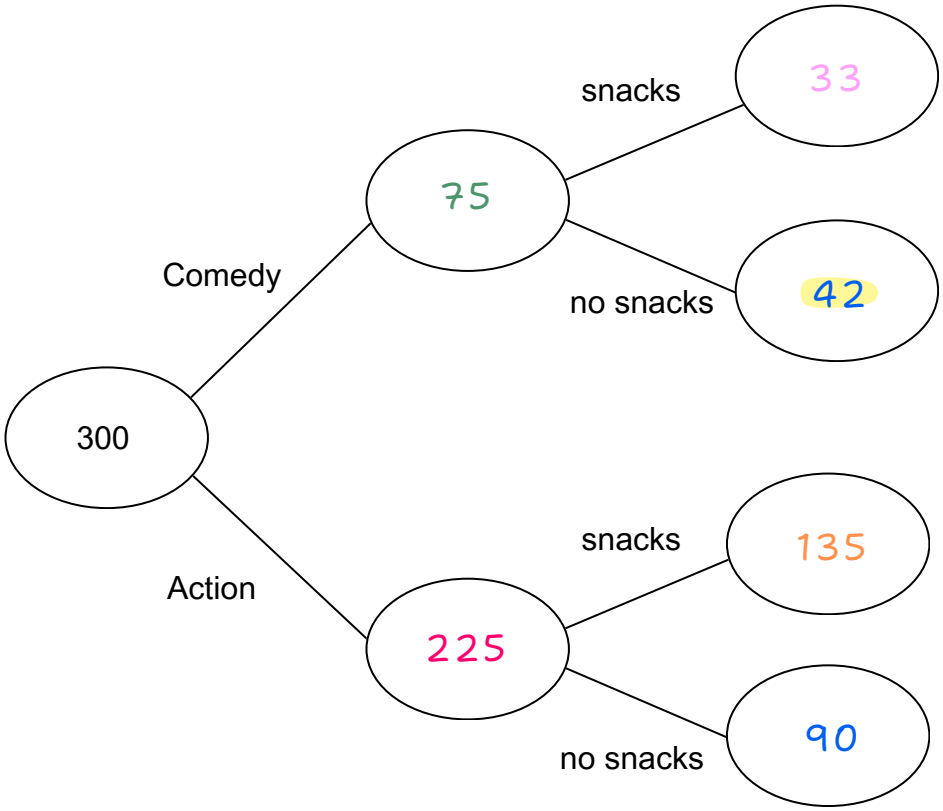
Do not write outside the box

14 300 people attended the cinema to watch a comedy or action movie.
25% watched a comedy movie. $300 \div 4 = 75$ $300 - 75 = 225$
Of the people who watched an action movie, three-fifths had snacks.
168 people had snacks in total. $\frac{3}{5} \times 225 = 135$ $168 - 135 = 33$

14 (a) Use this information to complete the frequency tree diagram below.

[3 marks]

✓ C1 (2 correct frequencies)
✓ C2 (3 or 4 correct frequencies)
✓ C3 (all correct frequencies)



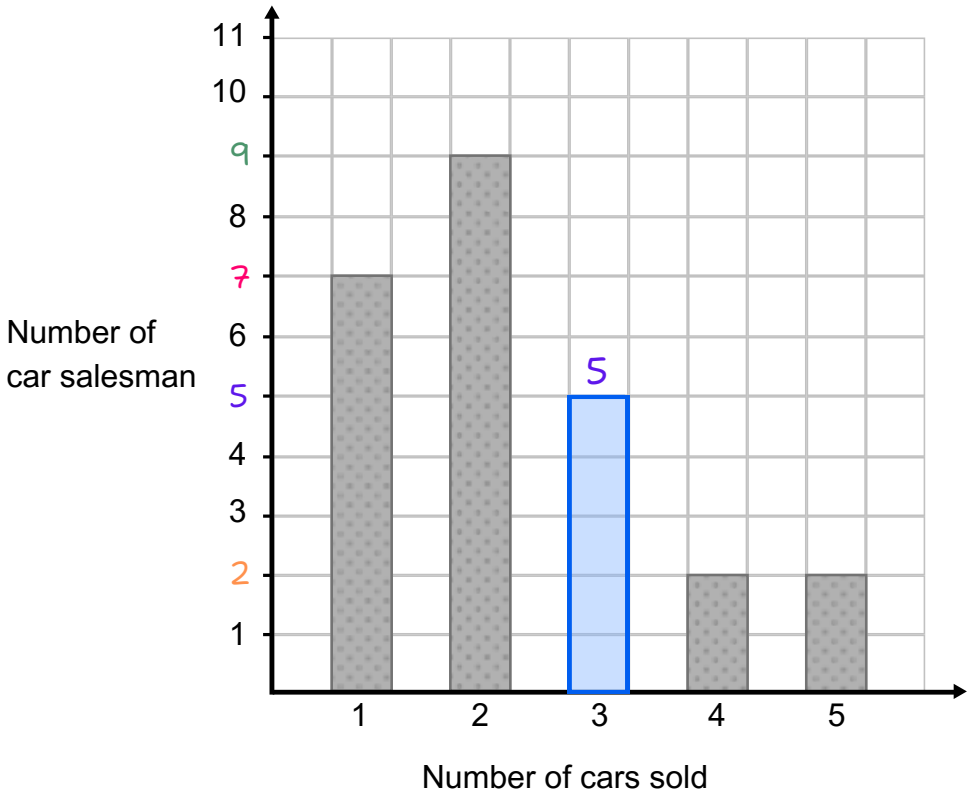
14 (b) One of the people is chosen at random.
Write down the probability that they watched a comedy movie with no snacks.

[1 mark]

Answer $\frac{42}{300}$ ✓ B1

Do not write outside the box

15 The bar chart shows information about the sales performance of a team of 25 car salesman in a 7 day period.



15 (a) Complete the bar chart. $25 - (7+9+2+2) = 5$ ✓ A1 Correct Bar **[1 mark]**

15 (b) Write down the modal number of cars sold. **[1 mark]**

💡 Modal: Most common

Answer 2 cars sold ✓ B1

15 (c) Work out the mean number of cars sold by the sales team. **[3 marks]**

$1 \times 7 = 7$ cars $2 \times 9 = 18$ cars $3 \times 5 = 15$ cars

$4 \times 2 = 8$ cars $5 \times 2 = 10$ cars ✓ M1 (finding any totals)

$\therefore$ mean cars sold $= \frac{7 + 18 + 15 + 8 + 10}{25} = 2.32$ ✓ M1

Answer 2.32 ✓ A1

Do not write outside the box

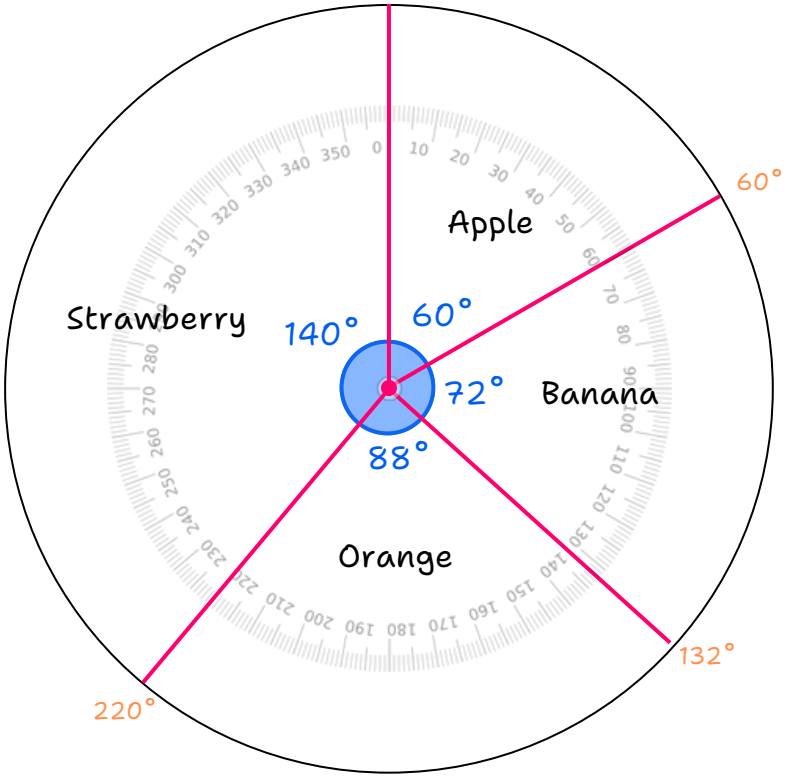
16 The table shows the favourite fruits of a group of 90 students.

Fruit	Frequency			Angle
Apple	15	x4	=	60°
Banana	18	x4	=	72°
Orange	22	x4	=	88°
Strawberry	35	x4	=	140°
	90			360°

60°
132°
220°
360°
x4

✓ M1 (to find angles)

Draw an accurate pie chart to represent this information. **[3 marks]**



✓ A1 (At least one correct drawn & labelled sector)
✓ A2 (fully complete correct & labelled pie chart)

Do not write outside the box

17 There are sour sweets in a bag.
The table shows information about their colour.

Colour	Red	Blue	Green	Yellow
Frequency	5	3	9	3

25% of the bag are red sweets.

The ratio

green sweets : yellow sweets is 3 : 1

A sweet is selected at random from the bag.

Work out the probability of the sweet being green. **[3 marks]**

25% = 5 sweets (x4)
100% = 20 sweets (x4)

20 − (5+3) = 12 ✓ B1

	G : Y	Total
(x3)	3 : 1	4 (x3)
	9 : 3	12

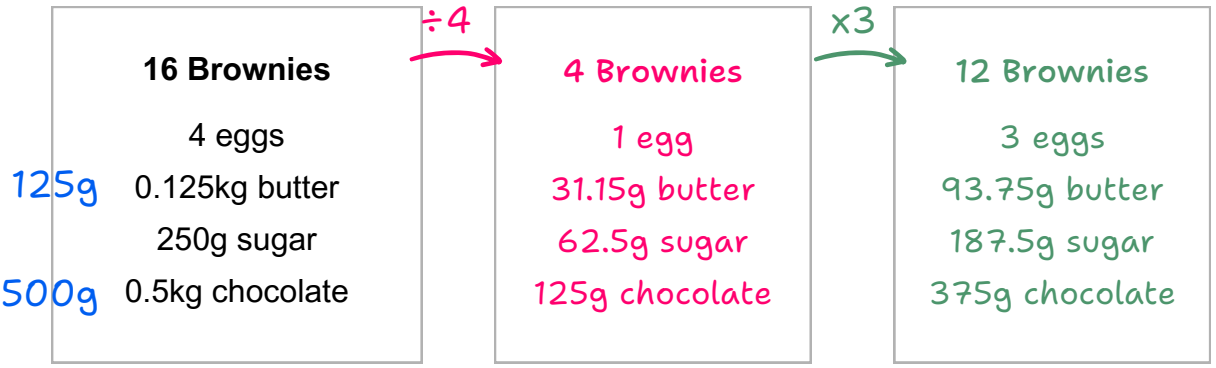
✓ M1

∴ P(Green) = $\frac{9}{20}$

Answer $\frac{9}{20}$ ✓ A1

Do not write outside the box

18 Here is the recipe to make 16 chocolate brownies.



Work out how much of each ingredient needed to make 12 brownies.
Give your answers in grams.

[3 marks]

💡 1kg = 1000g

✓ **M1** (Attempt to find ingredients as proportion of 16 brownies)

✓ **A1** (At least 2 correct values)
✓ **A2** (All 4 correct values)

eggs 3

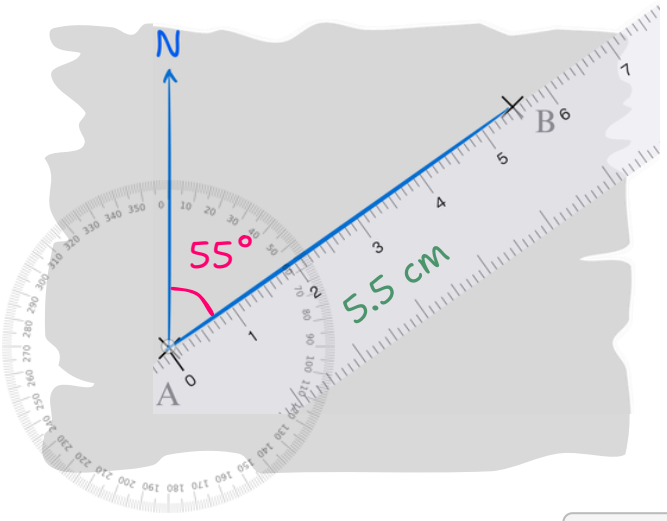
butter 93.75 g

sugar 187.5 g

chocolate 375 g

Do not write outside the box

19 Town A and B are shown on a scale map.



Scale 1 : 200,000

1cm : 200,000cm

1m = 100cm

19 (a) Work out the real distance between Town A and B.
Give your answer in metres. **[2 marks]**

Map : Real Life ✓ M1

x 5.5 ↓ 1 : 200,000 ↓ x 5.5

5.5 : 1,100,000 cm ∴ 1,100,000 ÷ 100 = 11000m

Answer 11,000 m

✓ A1 (Accept values in range: 10,200 – 11,400)

19 (b) Work out the bearing of Town B from A. **[2 marks]**

- Measure from north line
- Measure clockwise ↻
- Give answer in 3-digits

✓ M1 (Attempt to measure clockwise from A)

Answer 055 °

Do not write outside the box

20 Car A travels a distance of 150 km.
The time taken for the journey is 120 minutes.

20 (a) Work out the average speed that car A travelled.

[2 marks]

💡 1 hour = 60 minutes

2 hours = 120 minutes

Speed = $\frac{\text{Distance}}{\text{Time}}$

✓ M1

Speed = $\frac{150}{2}$ = 75

Answer 75 ✓ A1 km/h

Car B travels the same journey.
The time taken for car B was 20% faster than car A.

20 (b) Work out the average speed that car B travelled.

[3 marks]

Multiplier $1 - \frac{20}{100} = 0.80$

💡 km/h! Time must be in hours

Car A time = 120 minutes

Car B time = 120 x 0.80 = 96 minutes ✓ A1

∴ 96 ÷ 60 = 1.6 hours

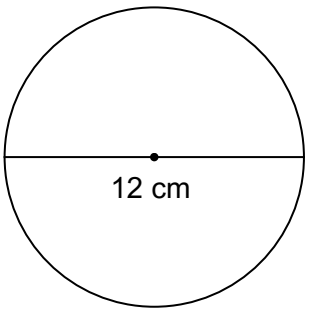
$S = \frac{D}{T}$ ∴ Speed = 150 ÷ 1.6 ✓ M1

= 93.75

Answer 93.75 ✓ A1 km/h

Do not write outside the box

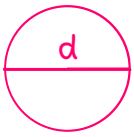
21 Here is a circle.



Not drawn accurately

Work out the the ratio

circle area : circle circumference.



Give your answer in its simplest form.

[3 marks]

diameter = 12 cm

Circumference = π x d

= π x 12

= 12π ✓ A1

radius = 12÷2 = 6cm

Area = π x r^2

= π x $(6)^2$

= 36π ✓ A1

A : C

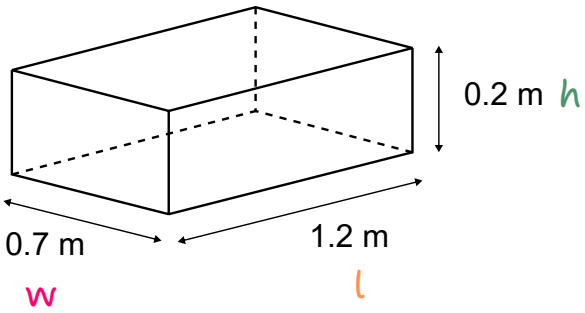
36π : 12π

36 : 12

Answer 3 : 1 ✓ A1

Do not write outside the box

22 Here is a solid cuboid.



The cuboid has a mass of 35kg.

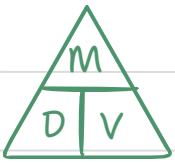
Work out the density of the cuboid, in kilograms per cubic metres.
Give your answer correct to 1 decimal place.

[3 marks]

💡 Volume = l x w x h

Volume = 1.2 x 0.7 x 0.2 ✓ M1

= 0.168 m^3



∴ Density = $\frac{\text{Mass}}{\text{Volume}}$

$= \frac{35}{0.168}$ ✓ M1

= 208.333...

Answer 208.3 ✓ A1 kg/m^3

Do not write outside the box

23 A utility bill changes from £80 to £90 between two months.

Work out the percentage increase of the utility bill.

[3 marks]

💡 % Change

$\frac{\text{difference}}{\text{original}} \times 100$

✓ M1

$\therefore$ % Change $= \frac{10}{80} \times 100$

$= 12.5\%$

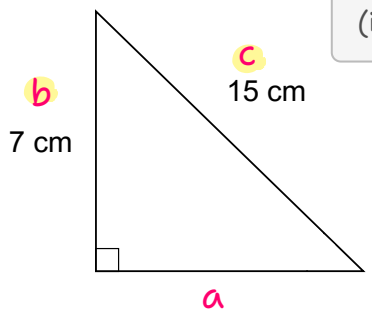
difference $= 90 - 80 = 10$

✓ M1

Answer 12.5 ✓ A1 %

24 Here is a right-angled triangle.

💡 'c' is always the longest side...
(it's not always the missing one!)



[3 marks]

Work out the perimeter of the triangle.

Give your answer correct to 1 decimal place.

$a^2 + b^2 = c^2$

$a^2 + 7^2 = 15^2$ ✓ P1

$a = \sqrt{15^2 - 7^2} = 13.266...$

✓ M1 (ft mark)

$\therefore P = 13.266... + 7 + 15$

$= 35.26649916$

Answer 35.3 ✓ A1 cm

Do not write outside the box

25 $A = 2 \times 3^3 \times 5^2$ A = 2 x 3 x 3 x 3 x 5 x 5 = 1350

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

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

[1 mark]

Answer 1350 ✓ B1

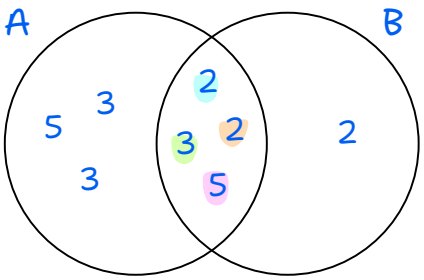
25 (b) Find the Highest Common Factor (HCF) of 2*A* and *B*.

[2 marks]

✓ M1

2A = 2 x 2 x 3 x ~~3~~ x ~~3~~ x 5 x ~~5~~

B = 2 x 2 x ~~2~~ x 3 x 5



💡 **HCF**: Multiply all the numbers in the intercept

💡 **LCM**: Multiply all the numbers in the union

∴ HCF = 2 x 2 x 5 x 3 = 60

Answer 60 ✓ A1

Do not write outside the box

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

[2 marks]

$a^n \times a^m = a^{n+m}$

$a^2 \times a^1 \times a^{-5} = a^{-2}$

Answer a^{-2} ✓ B1

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

$\dfrac{(4wc^3)^3}{8wc} = \dfrac{4^3w^3c^9}{8wc}$ ✓ M1

[3 marks]

$(a^n)^m = a^{nm}$

✓ M1

$= \dfrac{64w^3c^9}{8w^1c^1} = 8w^2c^8$

$a^n \div a^m = a^{n-m}$

$64 \div 8 = 8$

Answer $8w^2c^8$ ✓ A1

26 (c) Factorise fully $x^2 + 9x + 20$

[2 marks]

Need: A factor pair of 20 that sums to 9!

20's factor pairs: 1x20 2x10 5x4

✓ A1 ✓ A1

Answer $(x+5)(x+4)$

Do not write outside the box

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

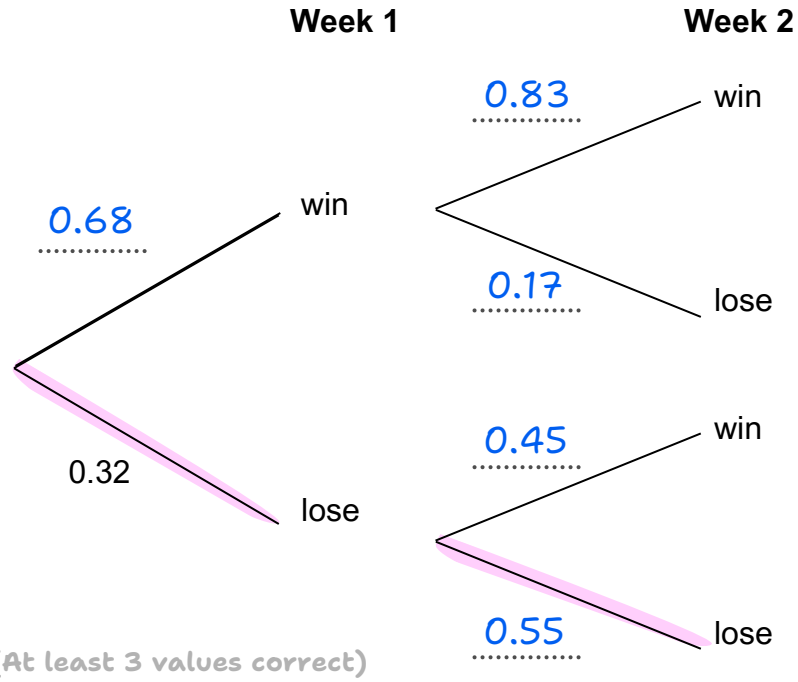
The probability that the player will lose on Week 1 is 0.32

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

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

Branches must add to 1



✓ A1 (At least 3 values correct)
✓ A2 (All 5 values correct)

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

✓ P1 (to find P(lose) or 3 ways to win)

P(Win at least once) = 1 – P(Lose)

= 1 – (0.32 × 0.55)

✓ M1

= 0.824

Answer 0.824 ✓ A1

END OF QUESTIONS