Candidate surname	Other names

Maths Planner

AQA

2024 Practice Paper

Mathematics

PAPER 2 (Calculator)

Foundation Tier

Time 1 hour 30 minutes

Worked Written Solutions ✓

Total Marks

80

Q	Topic(s)	Marks
1	FDP	/ 1
2	Percentages of Amounts	/ 1
3	Converting Metric Units	/ 1
4	Circle Properties	/ 1
5	Factors and Multiples	/ 1
6	Bank Statements	/ 3
7	Equations / Expressions / Inequalities	/ 2
8	Substitution	/ 1
9	Averages / Range	/ 5
10	Time Calculations	/ 2
11	Direct Proportion	/ 4
12	Area and Perimeter	/ 5
13	Money Problem	/ 4
14	Sequences	/ 4
15	Probability	/ 5

Q	Topic(s)	Marks
16	Volume	/ 3
17	Reflections	/ 2
18	Angles in Triangles / Solving Equations	/ 3
19	Similar Shapes	/ 2
20	Primes / Cubes / Triangular Numbers	/ 2
21	Ratio	/ 4
22	Reverse Percentages	/ 2
23	Angles in Parallel Lines	/ 2
24	Calculating with Speed	/ 4
25	Circles and Polygons	/ 3
26	Compound / Simple Interest	/ 4
27	Trigonometry / Pythagoras	/ 4
28	Equation of a Straight Line	/ 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 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.

Answers all questions in the spaces provided.

Do not write outside the box

1 Write $\frac{7}{8}$ as a decimal.

7 ÷ 8 = 0.875

[1 mark]

Answer 0.875 ✓ B1

2 Work out 30% of $90.

[1 mark]

% Multiplier

30 ÷ 100 = 0.30

90 x 0.30 = 27

Answer $ 27 ✓ B1

3 Write $1\frac{1}{2}$ metres in centimetres.

1.5m

[1 mark]

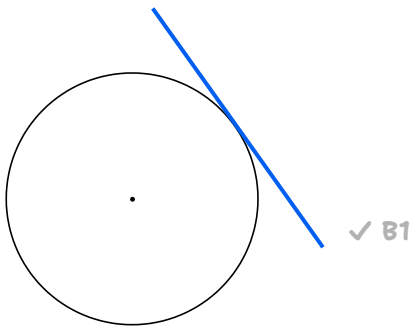
1m = 100 cm

1.5 x 100 =150

Answer 150 ✓ B1 cm

4 On the circle below, draw a **tangent** line.

[1 mark]



✓ B1

(accept any line touching one point on the circumference)

Do not write outside the box

5 Circle the factor of 12

💡 Factor: A number that 'goes in' to another

[1 mark]

5 24 48 4 ✓ C1

6 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			450.00
04.06.23	Salary	1800.00		2250 ✓ B1
06.06.23	Utility bill		100.50	2149.50
10.06.23	Grocery shopping		123.40 ✓ B1	2026.10
15.06.23	Car maintenance		300.00	1726.10 ✓ B1
20.06.23	Gift from friend	75.00		1801.10

450 + 1800 = £2250

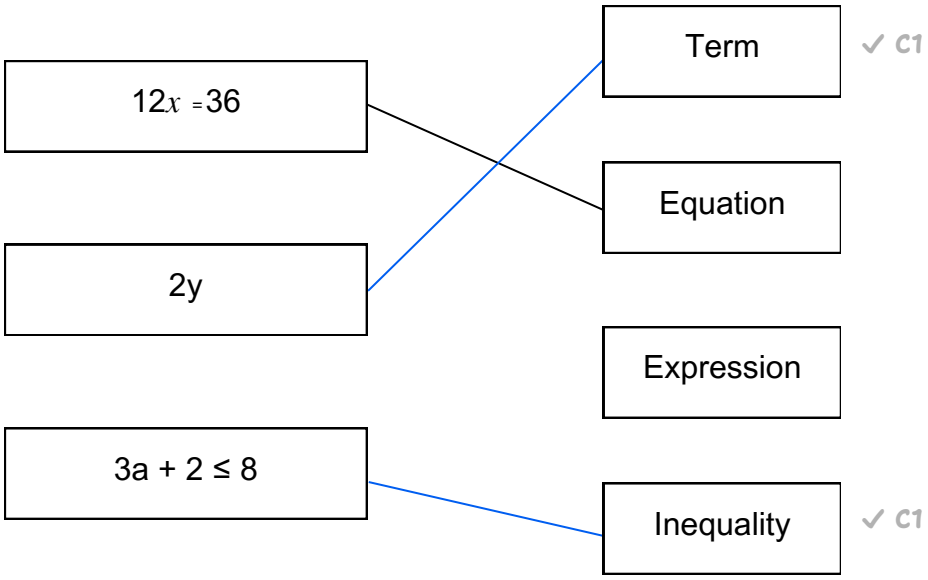
2149.50 - 2026.10 = £123.40

2026.10 - 300 = £1726.10

Do not write outside the box

7 Match the algebra to the correct description.
One has been done for you.

[2 marks]



✓ C1

✓ C1

8 If $x = -2$

Circle the value of $3x^2$

[1 mark]

B I D M A S

$3(-2)^2 = 3x(4)$
$= 12$

-36 | 12 | 36 | 1

✓ C1

Do not write outside the box

9 The table shows information of the temperatures in some cities.

City	Temprature
Cairo	21˚C
Moscow	-12˚C
New Delhi	16˚C
Helsinki	-5˚C

9 (a) Work out the **range** of temperatures of the cities. **[1 mark]**

💡 Range = Biggest – Smallest

21 - (-12) = 33

Answer 33 ✓ B1 ˚C

9 (b) Work out the **median** temperature of the cities. **[2 marks]**

💡 Median = Middle number (in order)

~~-12~~ -5 16 ~~21~~

$\frac{-5 + 16}{2} = 5.5$ ✓ M1

Answer 5.5 ✓ B1 or B2 ˚C

9 (c) Work out the **mean** temperature of the cities. **[2 marks]**

💡 Mean = total ÷ number of values

✓ M1

$\frac{-12 + (-5) + 16 + 21}{4} = 5$

Answer 5 ✓ B1 or B2 ˚C

Do not write outside the box

10 A train left station **A** at 09:42

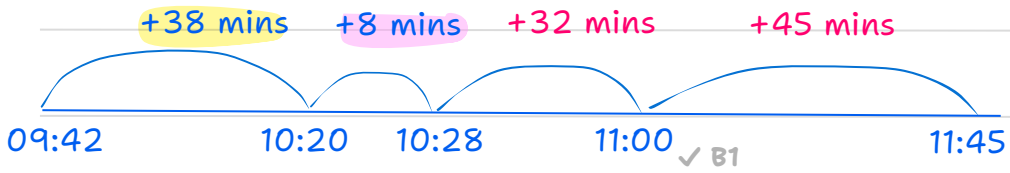
It took 38 minutes to arrive at station **B**, where it waits for 8 minutes before leaving for station **C**.

The train arrived at station **C** at 11:45.

💡 1 hour = 60 minutes

Work out the time of the train journey between station **B** and **C.**

[2 marks]



✓ B1

∴ 32 + 45 = 77 minutes 77 - 60 = 17 minutes

Answer 1hour 17 minutes or 77 minutes

✓ A1 ✓ A1

11 At a butchers

5kg of chicken costs £57.

2kg of chicken and 800g of beef steak cost £41.20.

Work out the total cost for 500g of chicken and 1.5kg of beef steak.

[4 marks]

1.5kg = 1500g

Chicken:

÷5 ↓ 5kg = £57 ↓ ÷5 ✓ M1

x2 ↓ 1kg = £11.40 ↓ x2

2kg = £22.80

÷2 ↓ 1kg = £11.40 ↓ ÷2

500g = £5.70

41.20 - 22.80 = £18.40 ✓ M1

∴ 500g (chicken) + 1.5kg (beef):

5.70 + 34.50 = £40.20

Beef:

÷8 ↓ 800g = £18.40 ↓ ÷8 ✓ M1

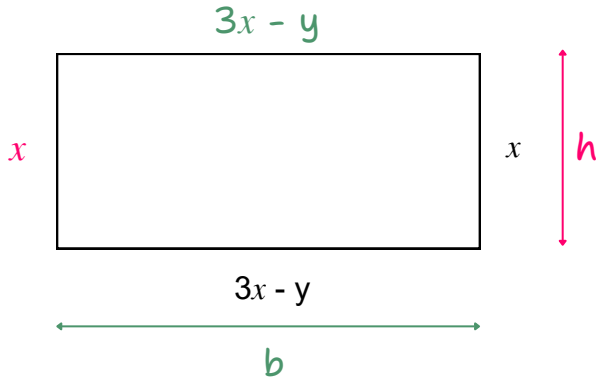
100g = £2.30

x15 ↓ 1500g = £34.50 ↓ x15

Answer £ 40.20 ✓ A1

Do not write outside the box

12 Here is a rectangle.



12 (a) Write an expression for the **area** of the rectangle.
Give your answer in its simplest form.

[2 marks]

💡 Area = b x h

$A = x(3x - y)$ ✓ M1

$= 3x^2 - yx$

✓ A1 ✓ A1

Answer $3x^2 - yx$ or $3x^2 - xy$

12 (b) Write an expression for the **perimeter** of the rectangle.
Give your answer in its simplest form.

[3 marks]

💡 Perimeter = sum of lengths

$P = x + 3x - y + x + 3x - y$ ✓ M1

$P = 8x - 2y$

✓ B1 ✓ B1

Answer $8x - 2y$

Do not write outside the box

13 A group of three friends went on holiday.
The total cost for all three was £3600.

32% was spent on flights

$\frac{2}{5}$ was spent on hotels

the remainder was spending money

Given the costs were split equally between them,
Work out how much spending money each friend had.

[4 marks]

% Multiplier

32 ÷ 100 = 0.32

Flights:

3600 x 0.32 = £1152 ✓ M1

Hotels:

$\frac{2}{5}$ x 3600 = 1440 ✓ M1

Total Spending Money:

3600 – (1440 + 1152)

= £1008

Spending Money per Person:

= £1008 ÷ 3 ✓ M1

= £336

Answer £ 336 ✓ A1

Do not write outside the box

14 Here are the first 5 terms of **Sequence A**, which follows the Fibonacci pattern.

💡 Fibonacci term-to-term rule:
Sum the previous two terms

2 → 5 → 7 → 12 → 19 → 31

+(2+5) +(5+7) +(7+12) +(12+19)

14 (a) Write down the next term in the sequence.

[1 mark]

Answer 31 ✓ B1

14 (b) Here is the first 3 terms of **Sequence B**

3 → 6 → 12 → 24 → 48 → 96

x2 x2 x2 x2 x2

Given **Sequence B** is **geometric**

Work out which sequence will have a term greater than 50 first.

[3 marks]

💡 Geometric term-to-term rule:
x or ÷ by the same amount

Sequence A: 2, 5, 7, 12, 19, 31, 50, 81 ... ✓ M1

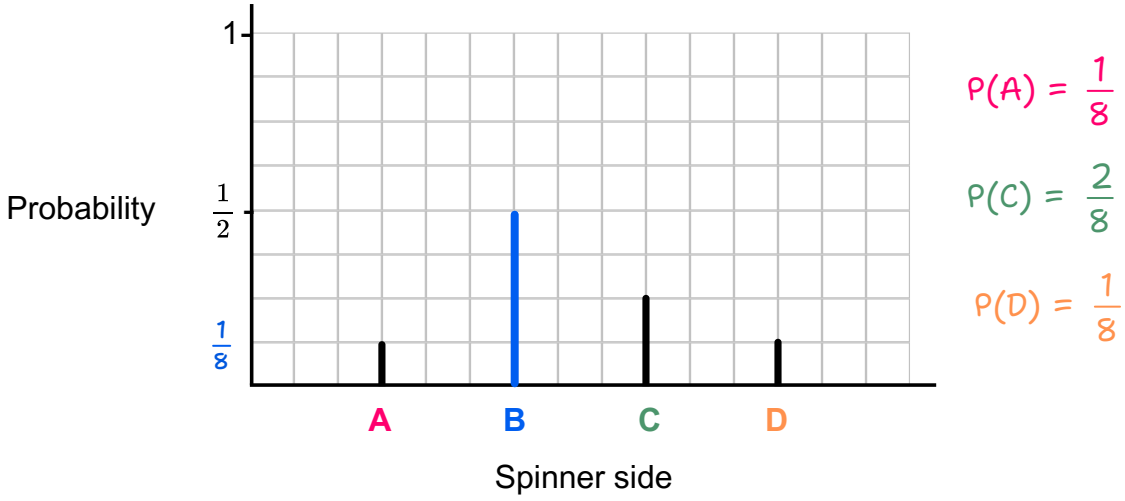
Sequence B: 3, 6, 12, 24, 48, 96, ... ✓ M1

✓ B1 (for both correct)

Answer **Sequence** B **Term** 6th or 96

Do not write outside the box

15 A 4-sided biased spinner can land on either **A**, **B**, **C** or **D**.
The probabilities are shown on the chart below.



$P(A) = \frac{1}{8}$

$P(C) = \frac{2}{8}$

$P(D) = \frac{1}{8}$

15 (a) Write down the probability the spinner will land on **D**.

[1 mark]

✓ B1

Answer $\frac{1}{8}$ = 0.125 ✓ B1

15 (b) Complete the chart for spinner side **B**.

[2 marks]

$P(C) = 1 - \left(\frac{1}{8} + \frac{2}{8} + \frac{1}{8}\right) = \frac{1}{2}$ ✓ A1 (for correct line on chart)

✓ M1

15 (c) The spinner will be spun 28 times.
How many times is the spinner expected to land on **C**?

[2 marks]

💡 **Expected Outcome** = probability x number of trials

$P(C) = \frac{2}{8}$

$= \frac{1}{4}$

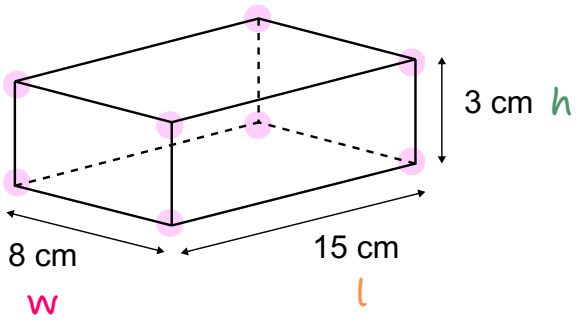
Expected = $\frac{1}{4} \times 28$ ✓ M1

$= 7$

Answer 7 times ✓ A1

Do not write outside the box

16 Here is a cuboid.



16 (a) Circle the number **vertices** the cuboid has.

[1 mark]

Vertices = corners

8 ✓ C1 6 12 4

16 (b) Work out the volume of the cuboid.

[2 marks]

Volume = l x w x h

Volume = 15 x 8 x 3 ✓ M1

= 360

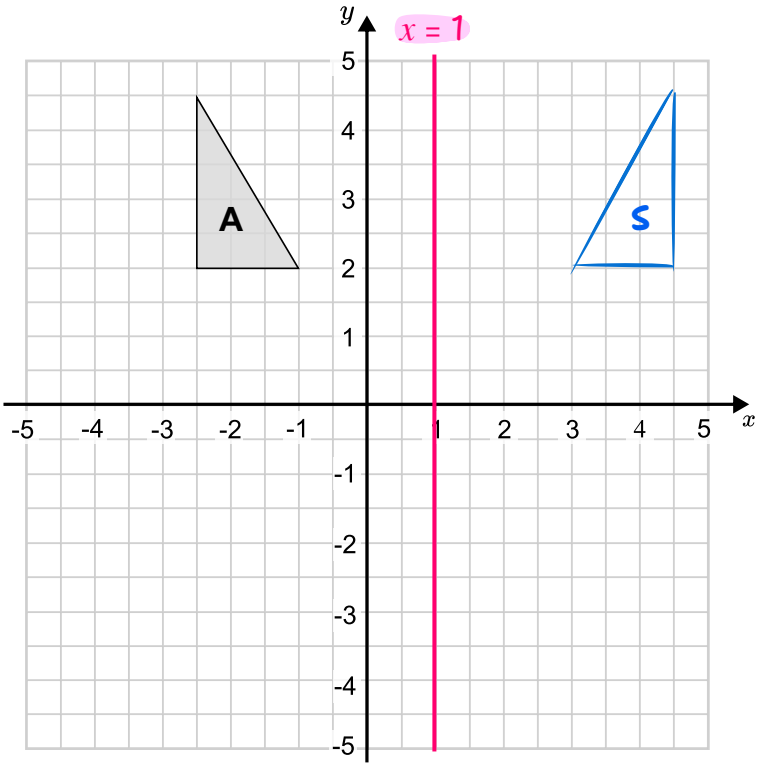
Answer 360 ✓ A1 cm³

Do not write outside the box

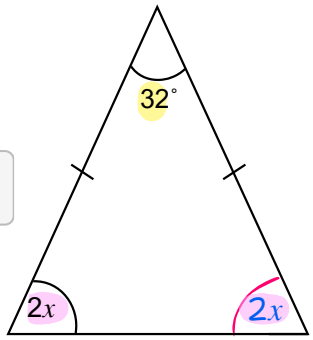
17 Reflect triangle **A** in the line $x = 1$
Label your image **B**.

✓ P1 (correct mirror line drawn)
✓ A2 (correct triangle drawn)

[2 marks]



18 Here is a triangle.



💡 Angles in triangles sum to 180°

💡 Isosceles triangles have equal base angles.

Work out the value of x.

[3 marks]

$\therefore 2x + 2x + 32 = 180$ ✓ P1

-32 ↓ $4x + 32 = 180$ ↓ -32

$\div 4$ ↓ $4x = 148$ ↓ $\div 4$

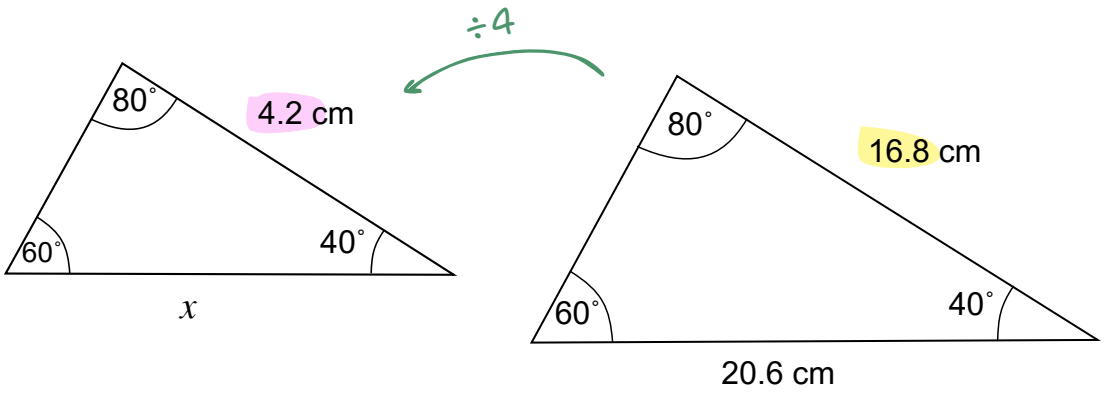
$x = 37$

Answer $x =$ 37 ✓ A1 °

Do not write outside the box

19 Here are two scalene triangles.

Not drawn accurately



Work out the size of length x.

[2 marks]

💡 All angles are equal → Triangles are similar

Scale Factor = 16.8 ÷ 4.2 = 4 ✓ M1

x = 20.6 ÷ 4 = 5.15

Answer x = 5.15 ✓ A1 cm

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

Work out the value of this integer cubed.

[2 marks]

Primes: 2, 3, 5, 7, ~~11~~, ...

Triangular: 1, 3, 6, ~~10~~, ... ✓ P1

💡 Integer: whole number

$\therefore 3^3 = 27$

Answer 27 ✓ A1

Do not write outside the box

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

[1 mark]

÷8 (8 : 12) ÷8

1 : $\frac{12}{8}$

Accept the forms:

✓ B1 ✓ B1

Answer 1 : $\frac{12}{8}$ 1 : $\frac{3}{2}$ 1 : 1.5

21 (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]

✓ M1

÷4 (4 parts = £24) ÷4

1 part = £6

+4 more parts

T : S Total ✓ M1

x6 (7 : 11 18) x6

42 : 66 108

Answer £ 108 ✓ A1

Do not write outside the box

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

[2 marks]

💡 Original = New ÷ Multiplier

Multiplier: 100% - 25% = 75%

75 ÷ 100 = 0.75 ✓ B1 (finding correct multiplier)

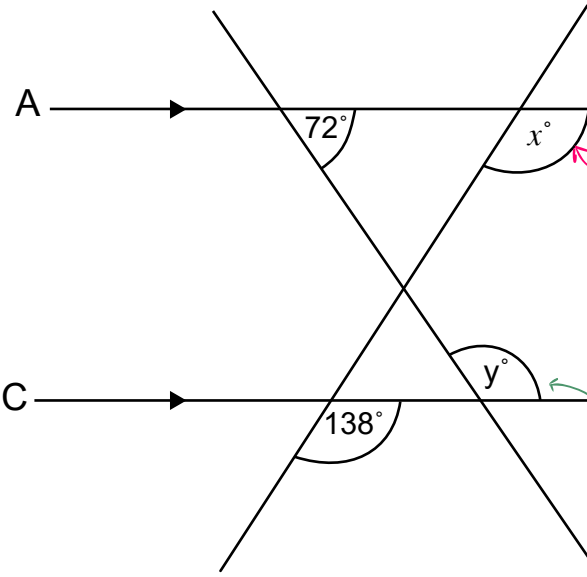
Original = 2062.50 ÷ 0.75

= 2750

Answer £ 2750 ✓ A1

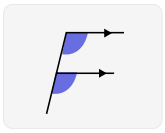
Do not write outside the box

23 AB and BC are parallel lines.

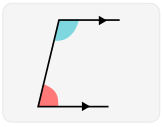


Not drawn accurately

$x = 138°$
Corresponding angles are equal



$y = 180-72 = 108°$
Co-interior angles sum to 180°



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

[1 mark]

Answer 138 ✓ B1 °

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

[1 mark]

Answer 108 ✓ B1 °

Do not write outside the box

24 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]

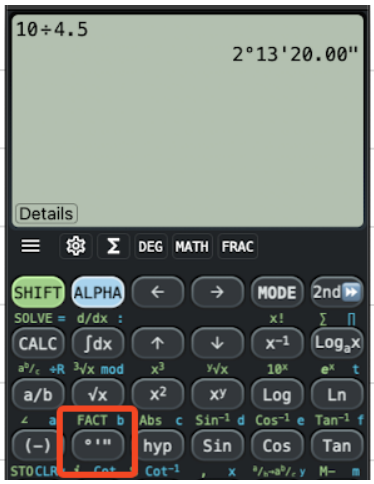
20 miles ÷ 2 = 10 miles to run

24 minutes ÷ 60 = 0.4 hours

$S = \frac{D}{T} = \frac{1.8}{0.4} = 4.5$ mph ✓ M1

$T = \frac{D}{S} = \frac{10}{4.5} = 2.\dot{2}$ hours ✓ M1

✓ P1 (for process to convert time)



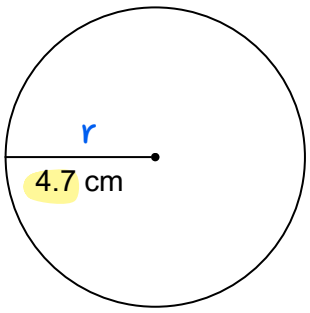
pressing [° ′ ″] button will convert your answer into hours, minutes & seconds!

Answer 2 hrs hrs 13 mins mins 20 secs secs

✓ A1 (all three correct values)

Do not write outside the box

25 (a) Here is a circle.



Not drawn accurately

Work out the area of the circle.

Give your answer to the nearest integer.

[2 mark]

Area = π x r^2

$A = \pi \times (4.7)^2$ ✓ M1

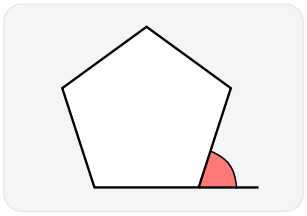
$A = 69.39778172$

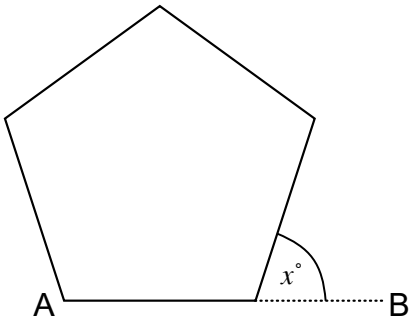
Answer 69 ✓ A1 cm²

25 (b) Here is a regular polygon.

AB is a straight line.

Not drawn accurately





Exterior Angle = $\frac{360}{N}$

Where N = number of sides

[1 mark]

$\therefore$ Exterior Angle = $\frac{360}{5} = 72°$

Answer x = 72 ✓ B1 °

Do not write outside the box

26 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% per annum thereafter	3.8% per annum

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

[4 marks]

Compound Multipliers

$1 + \frac{6}{100} = 1.06$

$1 + \frac{3.2}{100} = 1.032$

Simple Multiplier

$3.8 \div 100 = 0.038$

Zupa Bank

$3800 \times 1.06^{0.5} \times 1.032^{3.5} = £4368.33$ ✓ M1

Interest earned = 4368.33 - 3800

= £568.33

Sterling Bank

$3800 \times 0.038 = £144.40$ ✓ M1

Interest earned = 4 x 144.40

= £577.60

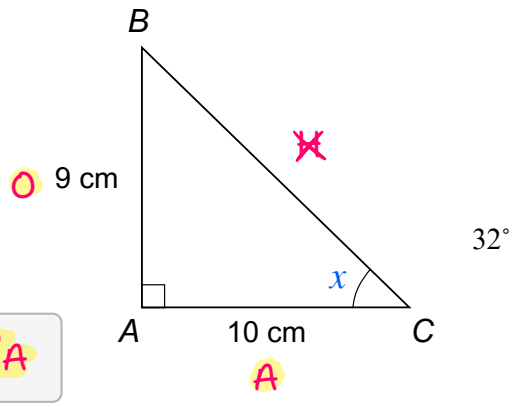
Difference in interest = 577.60 - 568.33 ✓ M1

= £9.27

Answer £ 9.27 ✓ A1

Do not write outside the box

27 Here is a right-angled triangle.



Not drawn accurately

O 9 cm H

32°

x

A 10 cm C

A

S°H C^AH T°A

27 (a) Work out the size of angle *ACB*.

Give your answer correct to 1 decimal place.

[2 marks]

$\tan\theta = \frac{O}{A}$

$\tan(x) = \frac{9}{10}$ ✓ M1

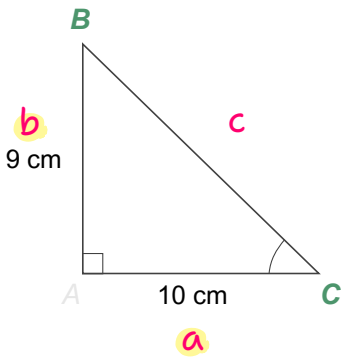
$x = \tan^{-1}\left(\frac{9}{10}\right) = 41.9872125$

Answer 42.0 ✓ A1 °

27 (b) Work out the size of length *BC*.

Give your answer correct to 3 significant figures.

[2 marks]



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

$10^2 + 9^2 = BC^2$ ✓ M1

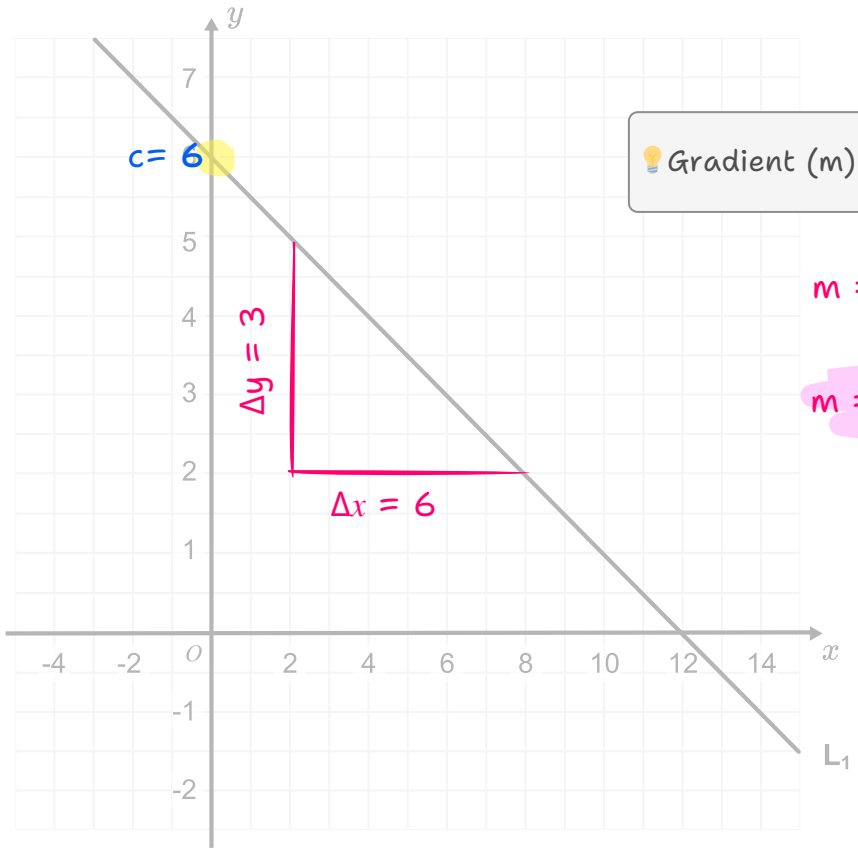
$181 = BC^2$

$\sqrt{181} = BC$ $BC = 13.45362405$

Answer 13.5 ✓ A1 cm

Do not write outside the box

28 The line L_1 is shown on the grid.



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

[2 marks]

Answer $y = -\frac{1}{2}x + 6$ ✓A1 ✓A1 or $y = -0.5x + 6$ ✓A1 ✓A1

28 (b) The line L_2 is parallel to L_1, and passes through the point (4, -6)

Write down the equation for the line L_2 in the form $y = mx + c$ **[3 marks]**

Parallel Lines: Have the same gradient

$\therefore$ L_2 gradient = -0.5 ✓B1

$y = mx + c$ $\quad -6 = -0.5 \times (4) + c$

+2 ↓ $\quad -6 = -2 + c$ ↓ +2 ✓P1 (to find c; sub in x,y values)

$-4 = c$

Answer $y = -0.5x - 4$ ✓A1 or $y = -\frac{1}{2}x - 4$ ✓A1

END OF QUESTIONS