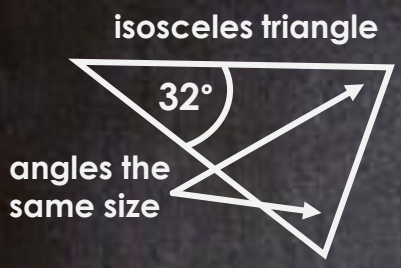

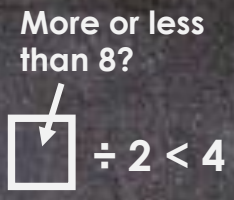

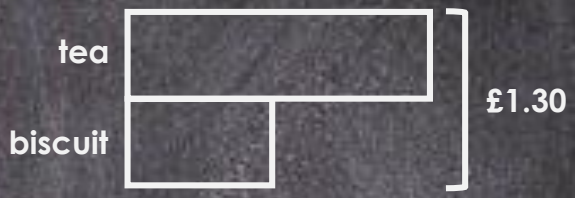

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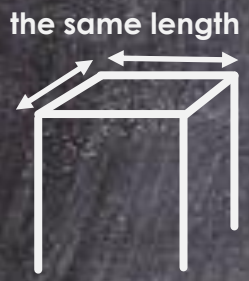

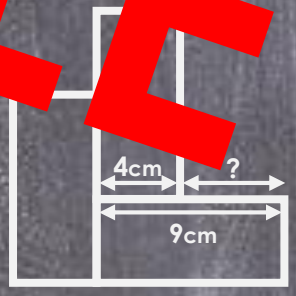

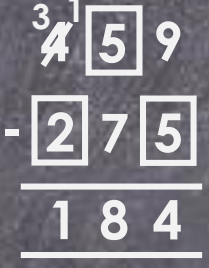

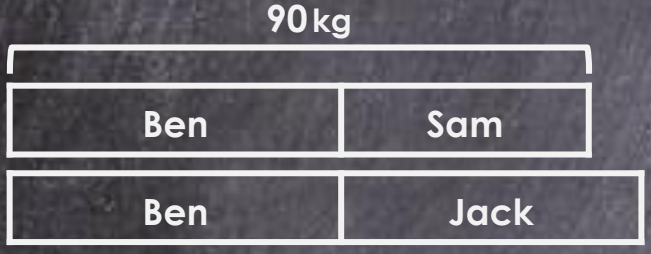

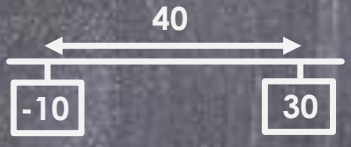

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Task 13 Question: Four numbers challenge

The sum of four whole numbers is 23.

The difference between the smallest and the largest number is 6.

All four numbers are different.

What could the four numbers be?

*Find **all the possible answers** to this question.*

The sum of four whole numbers is 23.

The difference between the smallest and the largest number is 6.

All four numbers are different.

What could the four numbers be?

*Find **all the possible answers** to this question.*

The sum of four whole numbers is 23.

The difference between the smallest and the largest number is 6.

All four numbers are different.

What could the four numbers be?

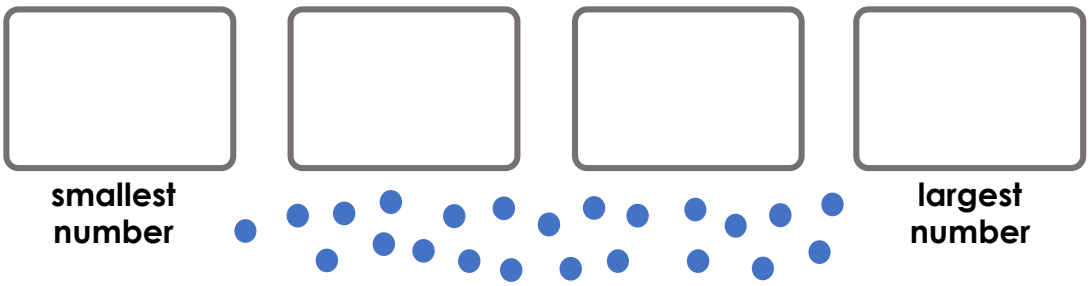
*Find **all the possible answers** to this question.*

Task 13 Prompts: Four numbers challenge

SUPPORT

Tip: Share 23 counters between four whiteboards.

Each whiteboard represents one of the numbers.



Remember: *the difference between the smallest number and the largest number is 6.*

EXPLAIN

Explain how you know that this statement is correct:

'The largest number must be more than 7'

EXTEND

The sum of four numbers is 25. All four numbers are different.

The difference between the smallest and the largest number is 4.

All four numbers are multiples of 0.5

What could the four numbers be?

*Find **all the possible answers** to this question.*

One answer: 4, 5.5, 7.5, 8

Task 14 Question: Café calculations

A cup of tea and a biscuit costs £1.30.

A cup of tea costs 60p more than a biscuit.

How much does a biscuit cost?

A cup of tea and a biscuit costs £1.30.

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How much does a biscuit cost?

A cup of tea and a biscuit costs £1.30.

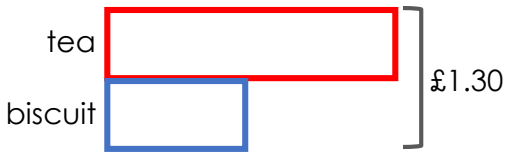
A cup of tea costs 60p more than a biscuit.

How much does a biscuit cost?

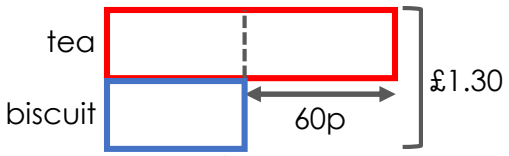
Task 14 Prompts: Café calculations

SUPPORT

STEP 1: tea + biscuit = £1.30



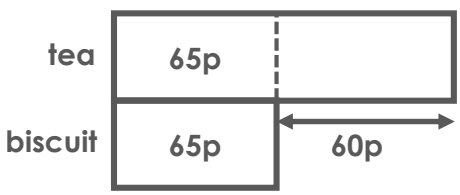
STEP 2: tea 60p more than biscuit



This bar model is split into 3 sections.
How big is each section?

EXPLAIN

Explain the mistake:



£1.30 ÷ 2 = 65p

Tea = £1.05

Biscuit = 65p

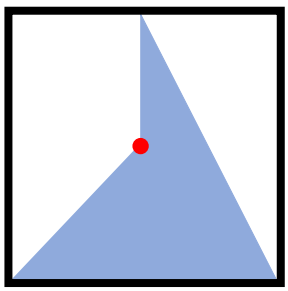
EXTEND

A cup of coffee and an apple costs £1.80.

The cup of coffee costs three times as much as the apple.

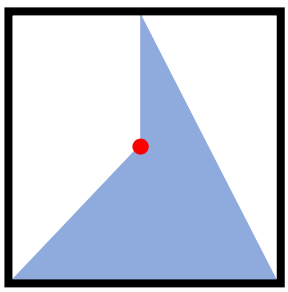
How much does a cup of coffee cost?

Task 23 Question: Fraction of square



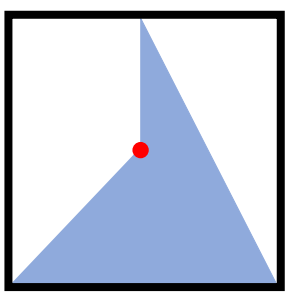
What fraction of the square is blue?

The red spot is in the middle of the square.



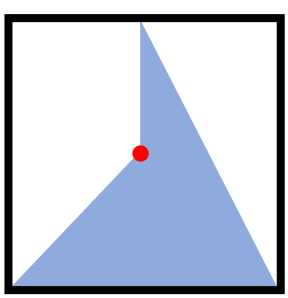
What fraction of the square is blue?

The red spot is in the middle of the square.



What fraction of the square is blue?

The red spot is in the middle of the square.



What fraction of the square is blue?

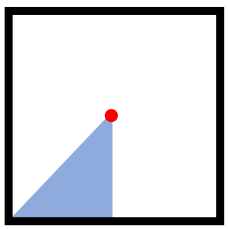
The red spot is in the middle of the square.

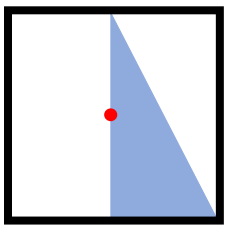
Task 23 Prompts: Fraction of square

SUPPORT

Tip:

- *Split the shape into two triangles.*
- *Each triangle is what fraction of the square?*
- *Add these fractions.*

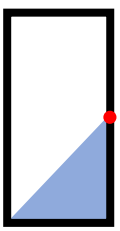




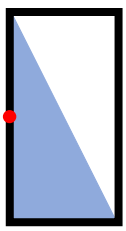
EXPLAIN

Explain the mistake:

'I split the shape into two triangles. I worked out the fraction of each triangle and added these fractions. The answer is $\frac{3}{4}$.



$\frac{1}{4}$

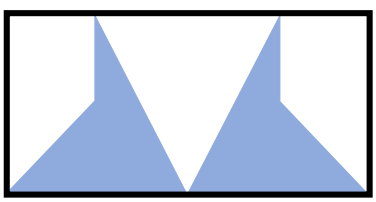


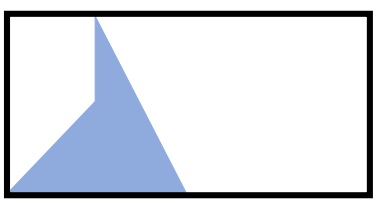
$\frac{1}{2}$

$$\frac{1}{4} + \frac{1}{2} = \frac{3}{4}$$

EXTEND

What fraction of each shape is shaded?



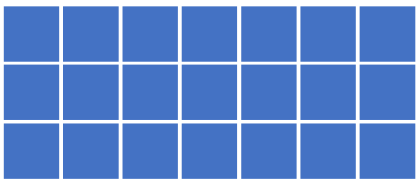


Task 43 Question: Change the perimeter

For this task you will need some small squares.

Make a rectangle with an area of 24 squares.
Make the perimeter as large as possible.

Example:



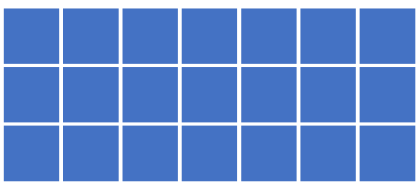
Area of this shape = 21 squares

Perimeter of this shape = 20

For this task you will need some small squares.

Make a rectangle with an area of 24 squares.
Make the perimeter as large as possible.

Example:



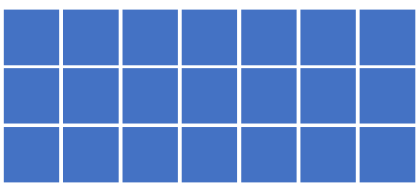
Area of this shape = 21 squares

Perimeter of this shape = 20

For this task you will need some small squares.

Make a rectangle with an area of 24 squares.
Make the perimeter as large as possible.

Example:



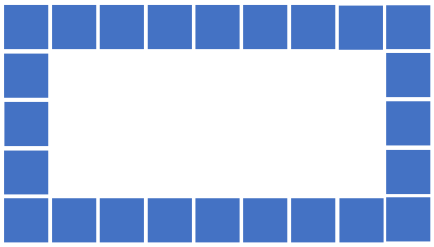
Area of this shape = 21 squares

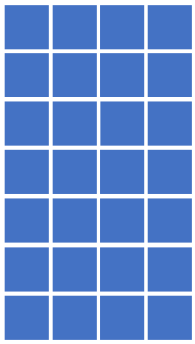
Perimeter of this shape = 20

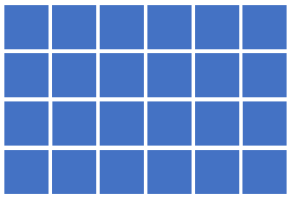
Task 43 Prompts: Change the perimeter

SUPPORT

Which of these shapes have an area of 24 squares?





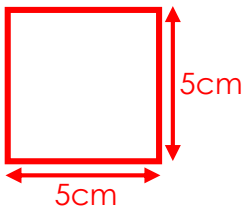


Explain the mistakes.

EXPLAIN

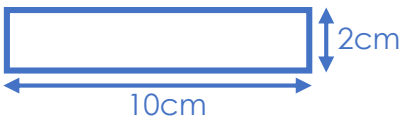
Order these shapes by area (smallest to largest). Then order the shapes by perimeter (smallest to largest).

Shape A:



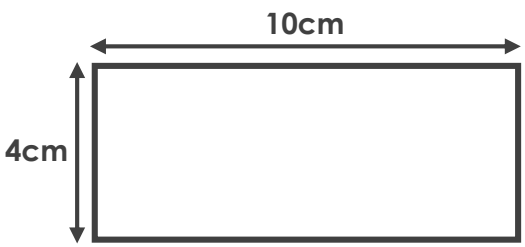
Shape B:

Shape C:



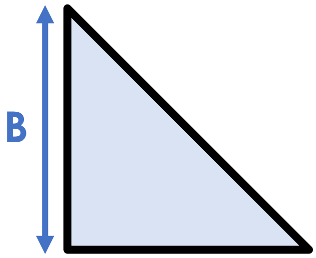
What do you notice?

EXTEND



*Draw a rectangle with a **larger area and a smaller perimeter** than this rectangle. Label the length and width of your rectangle.*

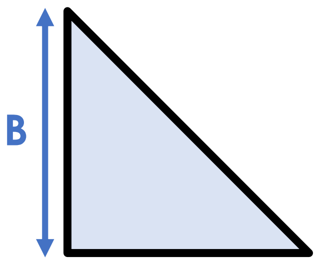
Task 47 Question: Triangle area



The area of an isosceles right-angled triangle is **less than** 150cm².

What is the largest possible value for length B?

Length B is a whole number.



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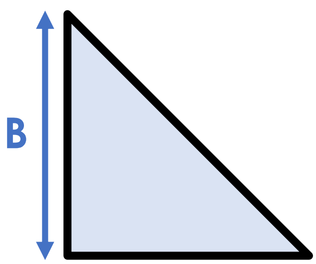

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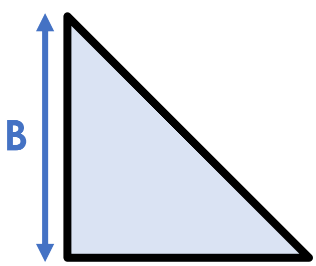


The area of an isosceles right-angled triangle is **less than** 150cm².

What is the largest possible value for length B?

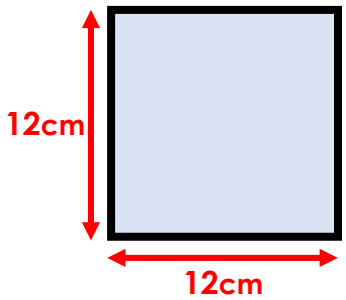
Length B is a whole number.

Task 47 Prompts: Triangle area

SUPPORT

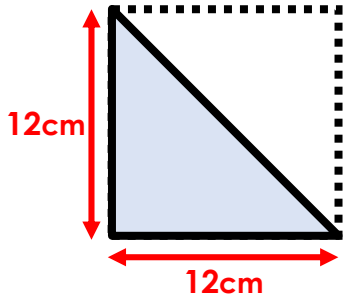
Area of this square:

12cm × 12cm = **144cm²**



Area of this triangle:

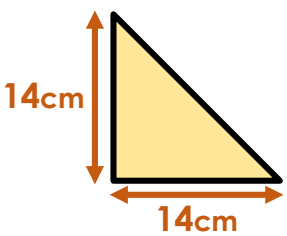
12cm × 12cm ÷ 2 = **72cm²**



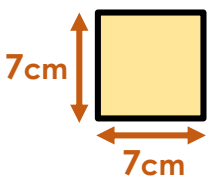
EXPLAIN

Which shape is the odd one out?

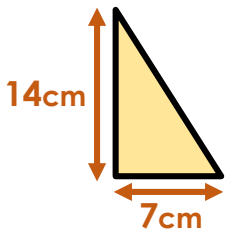
Shape A:



Shape B:

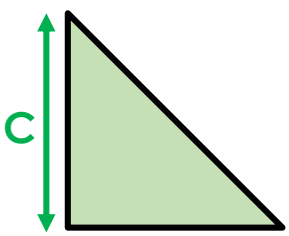


Shape C:



Challenge: *Think of a reason why* ***each shape*** *could be the odd one out.*

EXTEND



Rounded to the nearest 100cm², the area of an isosceles right-angled triangle is 300cm².

Length C is a whole number.

Find all the possible values of length C.

Ask your teacher if you are allowed a calculator for this question!

I SEE PROBLEM-SOLVING – UKS2 Answers

There are worked examples for each of the main questions. They can be downloaded for free at www.iseemaths.com/problem-solving-uks2

Task 13: Four numbers challenge: 3 sets of possible answers: 2, 6, 7, 8
3, 5, 6, 9 3, 4, 7, 9

Explain: If the largest number was 7 then the smallest number would have to be 1 for there to be a difference of 6 between the largest and smallest numbers. The other two numbers would have to add up to 15 (7 + 1 + 15 = 23). It is not possible for two numbers to add up to 15 without one of the numbers being larger than 7.

Extend: 4 5.5 7.5 8 4 6 7 8 4.5 5 7 8.5 4.5 5.5 6.5 8.5

Task 14: The café: Biscuit = 35p.

Explain: The difference between the cost of the tea and the biscuit was not subtracted from £1.30 before it was halved. Based on these calculations, the total cost would be £1.70 rather than £1.30.

Extend: Coffee = £1.35 (apple = 45p)

Task 23: Fraction of square: $\frac{3}{8}$

Explain: The parts are the same size but the whole has changed so the fractions made are incorrect.

Extend: $\frac{3}{8}$ $\frac{3}{16}$

Task 43: Change the perimeter: Maximum perimeter = 50 when squares arranged in a line (a rectangle with dimensions 24 × 1)

Explain: Area: shape B (15cm²), shape C (20cm²), shape A (25cm²)
Perimeter: shape A (20cm), shape C (24cm), shape B (32cm²)

Extend: 7cm × 6cm rectangle (area = 42cm², perimeter = 26cm)

Task 47: Triangle area: Largest length B = 17cm

Explain: Shape A does not have an area of 49cm². Shape B is not a triangle. Shape C has 3 sides of a different length.

Extend: Length C is 23cm, 24cm, 25cm, or 26cm

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