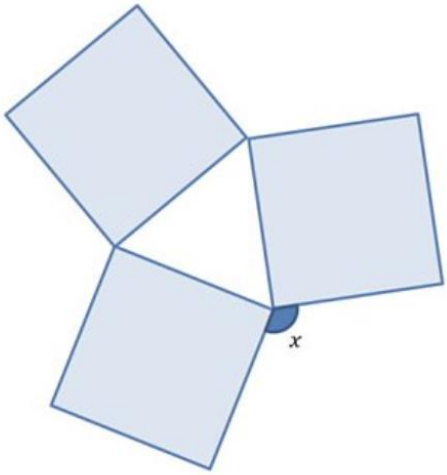
Maths Chilli Challenges

Challenge 1:

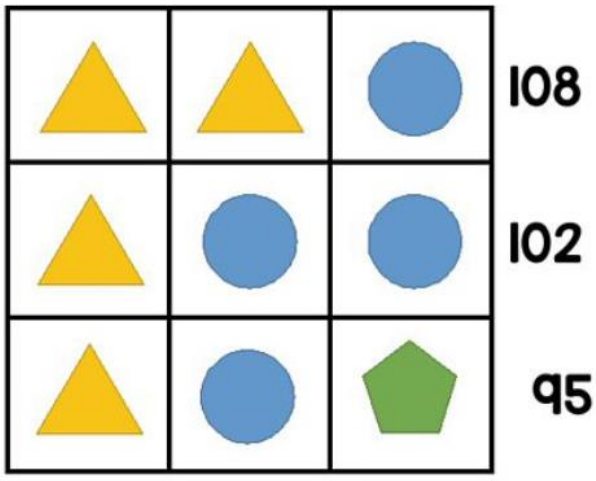
Three identical squares are arrange to make this pattern.



What is the size of the angle marked *x* ?

Challenge 2:

Here is a 3 x 3 grid with some shapes in.



Each shape represents a number.

The sum of each row is shown at the right of the grid.

Find the value of each of the shapes.

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Challenge 3:

Megan puts 4 fractions in order, starting with the smallest.

$\frac{1}{2}$ $\frac{\square}{8}$ $\frac{7}{\square}$ $\frac{\square}{5}$

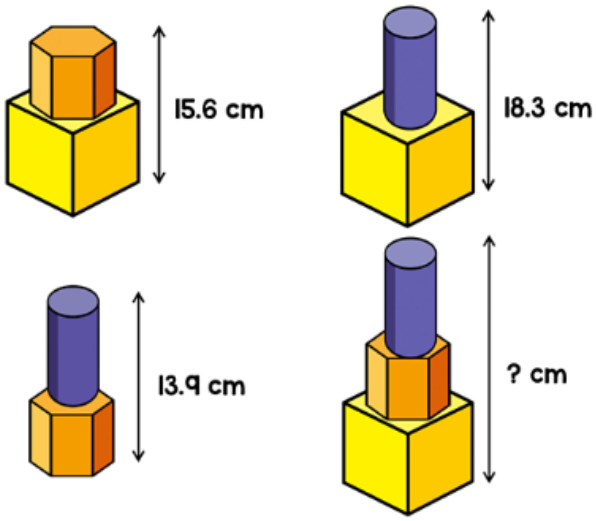
She has spilt some paint on some parts of the fractions.

What could the missing numbers be?

Challenge 4:

Liam has these three shapes.

He uses them to make different towers. He measures the height of each tower he makes.



Liam stacks all three shapes to make one tall tower. How tall is the tower?

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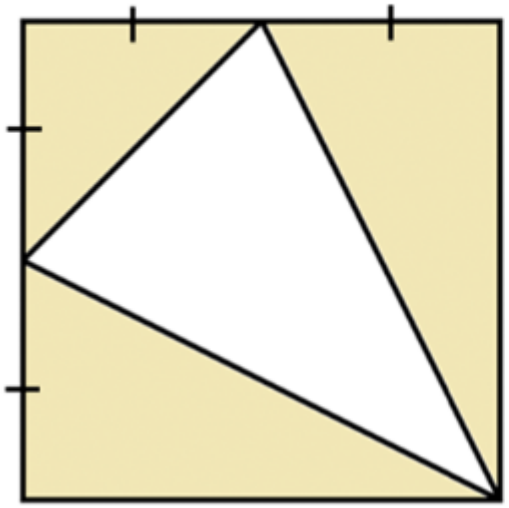
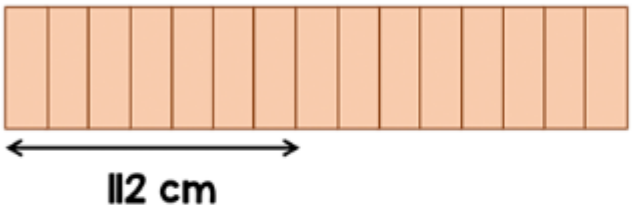
Challenge 5:

The diagram shows a square. The square has been divided into 4 triangles. What fraction of the square is shaded?



Challenge 6:

15 identical blocks are lined up as shown.



The length of each individual block is twice the width.

If all 15 blocks are then laid end to end lengthways, what is the total length of the blocks altogether now?

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Challenge 7: This activity is **worth exploring over a few days**. It is easy to start it but it involves quite a bit of mathematical thinking!

Watch https://nrich.maths.org/507 - Summing Consecutive Numbers

Consecutive Sums

$10 = 1 + 2 + 3 + 4$ $\quad 11 = 5 + 6$

$9 = 4 + 5$ and $2 + 3 + 4$

Some numbers are sums of consecutive numbers.

Can you make all the numbers this way?

Which numbers can be written in more than one way?

$12 = 3 + 4 + 5$ $\quad 13 = 6 + 7$

$14 = 2 + 3 + 4 + 5$

- Can you write any rules that show you how you can work out if a number has consecutive sums? There is than one rule!
- Some numbers do not have consecutive sums, can you find a rule for the numbers that do not have consecutive sums?

Once you have thought about these questions for a few days, you can have a look at the answers on the final sheet of this document or have a look at the solutions on https://nrich.maths.org/summingconsecutive/solution.

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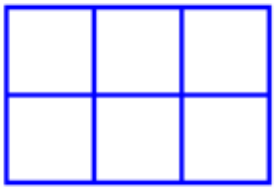
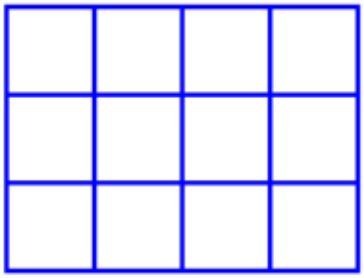
Challenge 8: Squares in Rectangles

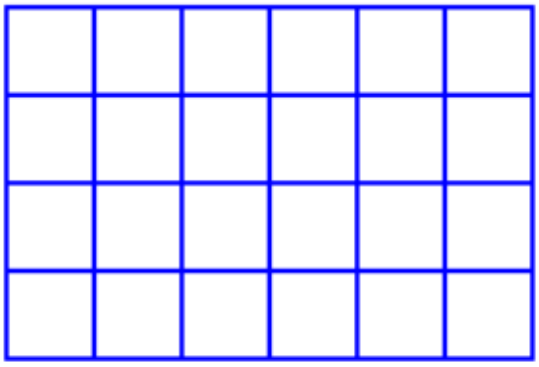
A 2 by 3 rectangle contains 8 squares. Can you see how?



A 3 by 4 rectangle contains 20 squares. Can you see how?



A 4 by 6 rectangle contains 50 squares. Can you see how?



What size rectangle contains exactly 100 squares?

Is there more than one?
Can you find them all?
Can you prove that there are no more?

If you are finding it difficult to start, you can have a look on here: https://nrich.maths.org/4835/clue.

Once you have thought about these questions for a few days, you can have a look at the solution on https://nrich.maths.org/4835/solution.

Answers

Challenge 1

120°

Challenge 2

Circle = 32, Triangle = 38 and Pentagon = 25

Challenge 3

5, 10, 5 (This is just one possible combination, there are multiple other answers as well!)

Challenge 4

The height of the last tower is 23.9cm

Challenge 5

The fraction shaded is 5/8 (or any other equivalent fraction)

Challenge 6

The length is 480cm

Challenge 7

See poster on the next page!

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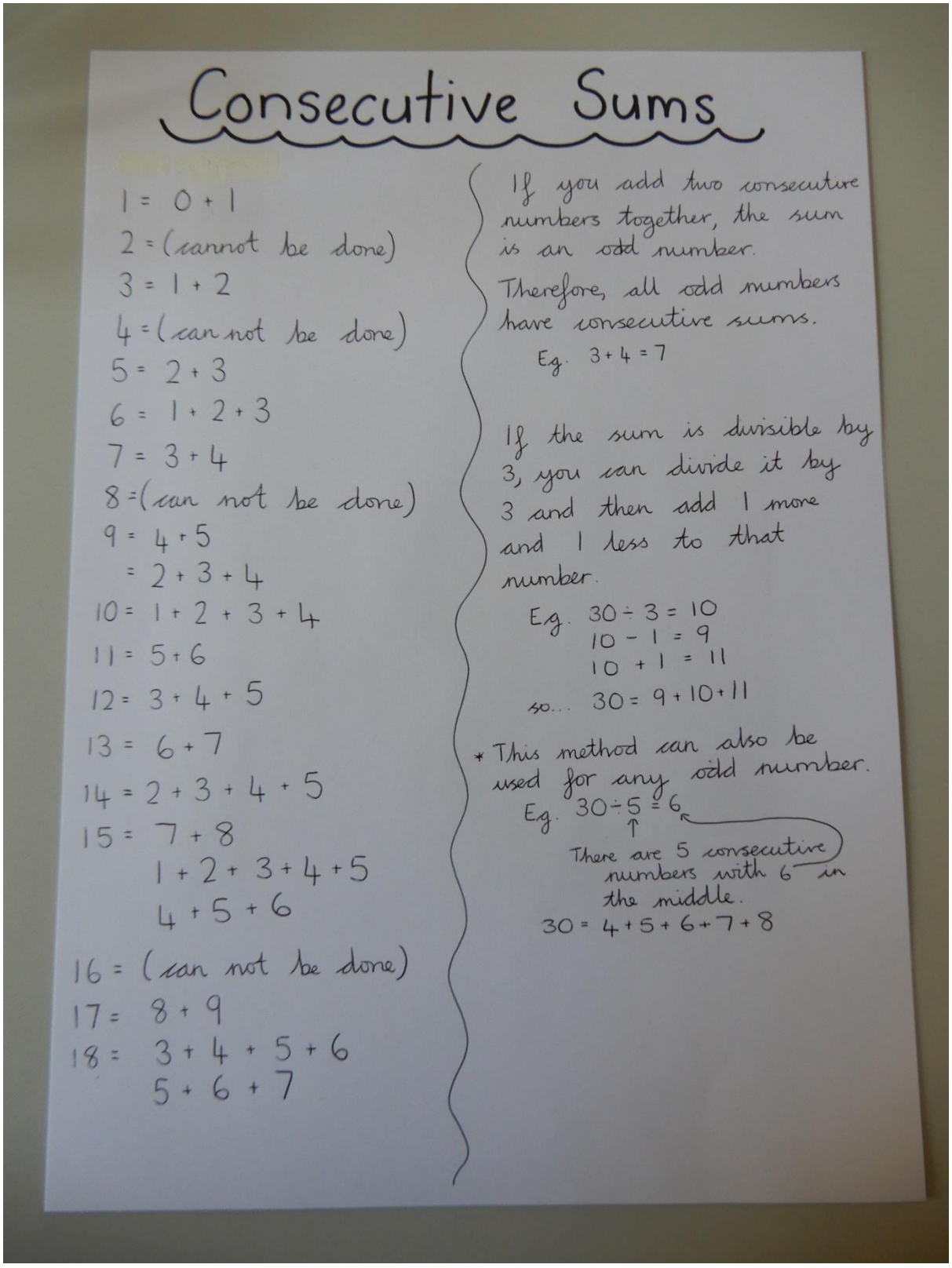

You can also refer to https://nrich.maths.org/summingconsecutive/solution for other solutions to the problem.

Maths Chilli Challenges

Challenge 8

Refer to https://nrich.maths.org/4835/solution.