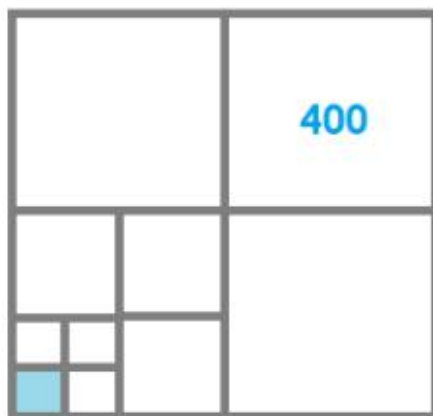


# 12 Days of Christmas Maths Puzzles

*Day 1:*

Santa loves maths puzzles! Below, there is a square, divided into smaller squares. The equation shows how many presents (**x**) he will give you this Christmas. Can you find **x**?



$$x = \sqrt{\text{blue square}} - 4$$



## 12 Days of Christmas Maths Puzzles

*Day 2:*

All the letters that Santa receives are automatically numbered. On his desk there are letters numbered from 118 to 2017 that he received today. How many letters does he have?



## 12 Days of Christmas Maths Puzzles

Elves are using coordinate geometry to design the toys and sweets for Christmas. Can you plot the coordinate points and connect them to find out what the elves are working on at the moment?

Start:  $(0, -5)$ ;  $(1, -5)$ ;  $(1, -3)$ ;  $(5, -3)$ ;  $(3, 1)$ ;  $(4, 1)$ ;  
 $(2, 6)$ ;  $(3, 6)$ ;  $(1, 9)$ ;  $(2, 9)$ ;  $(0, 12)$ ;  $(1, 11)$ ;  
 $(1, 12)$ ;  $(2, 13)$ ;  $(\frac{1}{2}, 13)$ ;  $(0, 14)$  Stop.

Now reflect it symmetrically with respect to the y-axis



## 12 Days of Christmas Maths Puzzles

*Day 4:*

Elves and reindeer are outside preparing Santa's sleigh for Christmas. They have 18 heads and 48 legs. How many reindeer and elves are there?





*Day 5:*

Santa is busy working out some sums, but he can't find his calculator! Can you help him simplify this fraction? Can you do it without using a calculator?

$$\frac{5555550}{5555551^2 - (5555550 \times 5555552)}$$

Hint – try to substitute  $x$  for 5555550, or try with simpler numbers to see if find a pattern.



## 12 Days of Christmas Maths Puzzles

*Day 6:* Santa's favourite puzzle is sudoku. Can you help Santa work out this puzzle? Each of the nine blocks has to contain all the numbers 1-9 within its squares. Each number can only appear once in a row, column or box.

	5	3			8		9	7
8					2			
			9		7	2		
		2	4	3			6	8
5	3			6	1	9		
		5	1		6			
			5					6
7	9		8			1	5	





## 12 Days of Christmas Maths Puzzles

*Day 7:* Elves love warming up their chilly toes on Winter nights in their Jacuzzi! They have 2 taps from which they can fill it. It takes two hours to fill the jacuzzi using tap number 1, and 6 hours using tap number 2. How long will it take to fill with water using both taps?





Maths Week  
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## 12 Days of Christmas Maths Puzzles

*Day 8:* Every visitor at the North Pole has to sign in to the Visitors' Book. There were 6869 digits used to number all pages of it. How many pages are there in the book?





## 12 Days of Christmas Maths Puzzles

*Day 9:* There are 23 elves working in one of Santa's toy factories. They greet each other with a hand shake before they start work. How many handshakes will there be in total?  
Simpler version-link

Warm up exercise: Greet and shake hands with some of your colleagues at your table. If everyone at your table shakes hands with each other, how many handshakes would you have?





## 12 Days of Christmas Maths Puzzles

*Day 10:*

Can you complete the Magic Square below?  
Fill in the numbers 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 16 such that the sum of the entries of any row, any column, or any main diagonal is the same.

13		4	
	10		5
		9	
3	15		



## 12 Days of Christmas Maths Puzzles

*Day 11:*

An elf has hidden the number of days until Christmas behind the triangle in the equation. Can you work out how many days are left till Christmas! Identical shapes are identical numbers.

$$\begin{aligned}
 & \text{○} + \text{○} = 10 \\
 & \text{○} \times \text{○} + \text{□} = 25 \\
 & \text{○} + \text{□} - \text{△} \times \text{○} = \text{□} \\
 & \text{△} = ?
 \end{aligned}$$





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## 12 Days of Christmas Maths Puzzles

*Day 12:* 5 elves eat 5 mince pies in 5 minutes. How long will it take 50 elves to eat 50 mince pies?

*Merry Christmas!*





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# 12 Days of Christmas Maths Puzzles

