Let's Investigate

Look at this calendar.

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

A box has been drawn around four dates.

Multiply the smallest number by 4 and add 16 to the product. Write down the answer.

Add the four numbers together. Write down the answer.

What do you notice about the two answers?

Repeat for other sets of four numbers.

Does this work for any month?

Can you explain using words or symbols what is happening?

The Puzzler

What is the cost of 1 large button, if 2 large buttons and 3 small buttons cost 69p, and 2 large buttons and 4 small buttons cost 80p?

Let's Investigate

Investigate each of the following.

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Look at the four dates in the 2 × 2 box.

- What do you notice about the sums of pairs of diagonally opposite numbers?
- What do you notice about the difference between the product of pairs of diagonally opposite numbers?

Look at the dates in the shaded column.

- Find the sum of the five numbers. What is the relationship between the total and the middle date?

Do these work for any month?

What other amazing patterns are there on a calendar?

Investigate dates in 3 × 2, 3 × 3, 4 × 2 and 4 × 4 boxes.

Investigate three dates in a column.

Name:

The Maths Herald

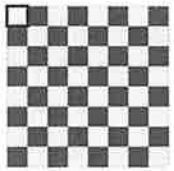
Volume 5

Date:

Let's Investigate

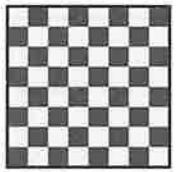
How many squares are there on a chessboard?

If you said 64 you would be wrong!

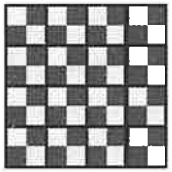


There are a whole lot more, for example:

There is one 8 × 8 square.



There are 16 2 × 2 squares like this (although there are even more 2 × 2 squares).



There are many more different-sized squares on a chessboard.

So, how many different sized squares are there altogether on a chessboard?

Let's Investigate

Step 1: Choose any three-digit number.	632
Step 2: Multiply the number by 10.	6320 (632 × 10)
Step 3: Find the difference between the numbers in Steps 1 and 2.	5688 (6320 – 632)
Step 4: Divide the answer from Step 3 by the Step 1 number.	9 (5688 ÷ 632)

Repeat several times choosing different three-digit numbers each time.

What do you notice?

Does this work for one-digit, two-digit and four-digit numbers?

Write an expression or formula to explain why this happens.

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Let's Investigate

1 2 3 4 5 6 7 8 9

Arrange the digits 1 to 9 in order, smallest to largest. Combine any number of digits together and insert any of the four operations between the numbers.

For example:

12 + 34 − 5 + 67 − 89 = 19

123 × 456 − 789 = 55 299

What's the smallest answer you can make?

What's the largest answer you can make?

The Puzzler

Start with 1000.

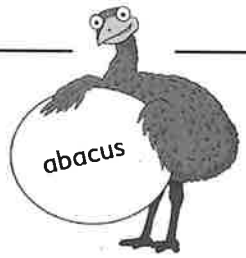
Using each of the digits 1 to 9 only once, and any of the four operations as many times as you like, write a calculation that equals 0.

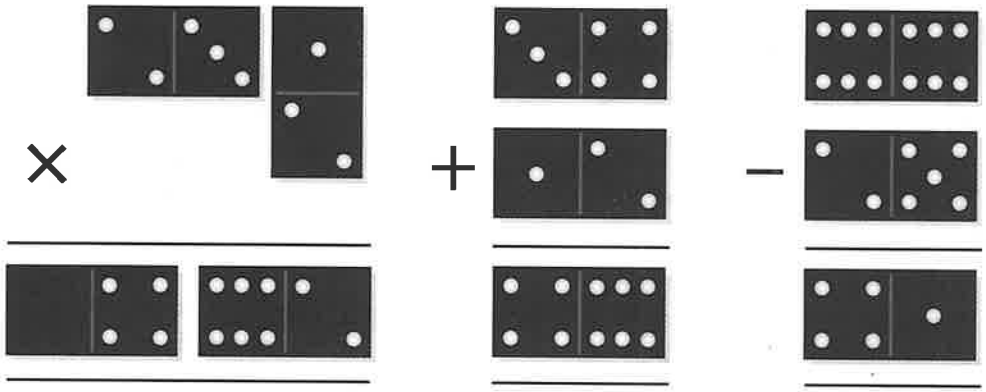
1000

0

Let's Investigate

Look at these domino calculations.





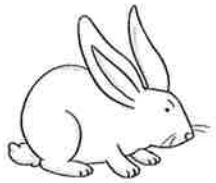
Investigate what other calculations you can make using a set of dominoes.

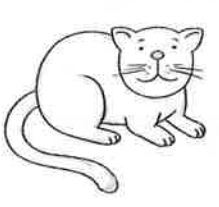
Money Matters

Do you have a pet?

If so, how much does it cost to keep your pet?

If you don't have a pet, choose a common household pet such as a cat or a dog and investigate how much it costs to keep the pet.



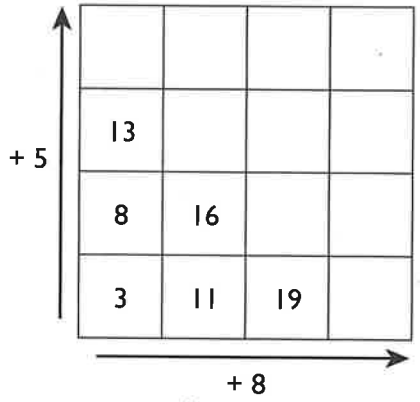


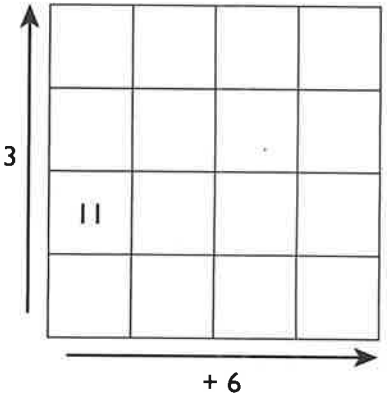
Whether you have a pet or not, calculate how much it costs a month and a year.

Given that the average lifespan is about 12 years for a dog and 15 years for a cat, how much does it cost to keep a dog or cat for its lifetime?

The Puzzler

Look at each of these squares. Fill in the missing numbers.





Make some puzzles like these of your own. Think about how you might make them slightly different to the puzzles above.

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