

# Puzzle Page

1 2 3 4

## Part 1

Consider the numbers 1, 2, 3, 4.

Using some or all of these numbers and the signs  $+$   $-$   $\times$   $\div$   $()$  try to make the numbers 5, 6, 7, 8, 9, 10, 11, etc ... (Countdown style)

eg, for 11:  $3 \times 2 + 4 + 1 = 11$ , or  $4 \times 3 - 1 = 11$

Concatenation (eg,  $14 - 3 = 11$ ) or using indices (eg,  $2^3 + 4 - 1 = 11$ ) are not permitted.

What is the first number that **cannot** be made?

## Part 2

Now try using 1, 2, 3, 4, 5.

What is the **first** number that **cannot** be made?

1, 2, 3, 4, 5, 10.

What is the first number that cannot be made?

1, 2, 3, 4, 5, 100.

What are the first **two** numbers that cannot be made?

Here are some more that I have answers to – I've aimed to find the **first two** numbers that cannot be made in each case.

2, 3, 4, 5.

2, 3, 4, 5, 10.

2, 3, 4, 5, 100.

If you have enjoyed these, on the website at [www.atm.org.uk/mt/](http://www.atm.org.uk/mt/) are a list of many others that Stephen has answers to. In some cases he's looked for the first three (where the third is considerably bigger than the first two).

Stephen Mack lives in Cambridgeshire and enjoys creating and solving various kinds of puzzles.

*Belated Happy New Year!*

$$2006 = 2 \times 17 \times 59$$

When is the next year which is a product of exactly three different prime numbers?

Colin Foster teaches at King Henry VIII School, Coventry, and edits MT.



**Unlucky first?**

Always, Sometimes or never true -

'Months that begin on a Sunday will always have a Friday 13th'?

Can two adjacent months both have a Friday 13th?

What is the most/least number of Friday 13ths possible in one year?

What other statements can you make?

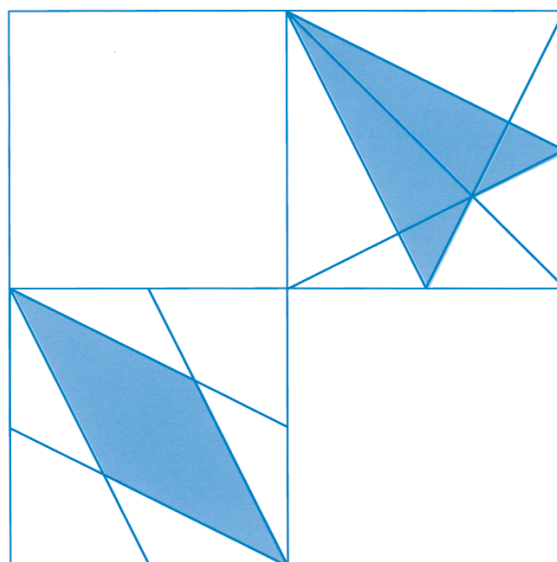
Helen Williams edits MT and is a consultant for early years mathematics.

## More than you think

In this picture on the right, points are mid-points if they look as if they are midpoints.

What do the shaded region in the top square and the shaded region in the bottom square have in common? What else do they have in common?

Derek Ball used to edit MT.



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