

# 13

## THE DIFFY SQUARE CHALLENGE

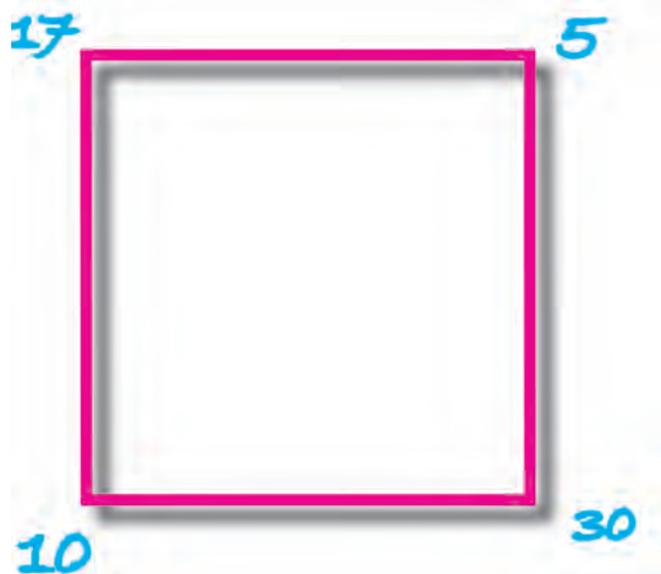
### ROB EASTAWAY

Rob Eastaway is an author and speaker, well known for his work making maths accessible to children and adults. His bestselling books include *Maths for Mums and Dads* and *Why Do Buses Come in Threes?* His latest book is called *Any Ideas?* and is about how to think creatively.

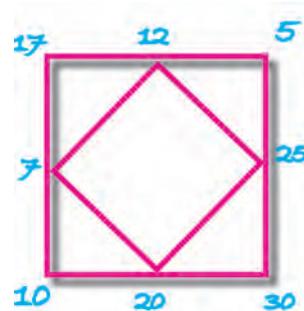
You can find out more about him at [www.RobEastaway.com](http://www.RobEastaway.com)

**Diffy squares are simple - and yet mysterious. Here's how to make a diffy square.**

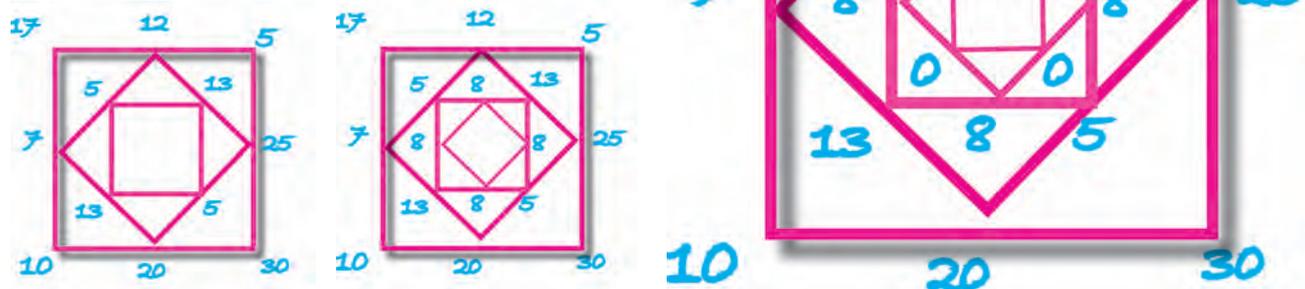
Draw a square, and then put four different numbers at the corners. For example:



Now find the difference between the numbers at the neighbouring corners and write the answer at the mid-point between them. For example  $17-5=12$ , so write 12 midway between 17 and 5. Join these mid-points to make a new square (which looks like a diamond), like this:



Next, find the differences between the corners of the square, and again put the answers at the mid-points and join them to make a square. Repeat this until you end up with a square in the middle that is all zeroes, like this:



**In the example above, we created a total of five diffy squares if you include the first square and the final 'zero' square (count them to confirm that you agree).**

## YOUR CHALLENGES

1. Create your own starter square, putting four different numbers at the corners. Now 'Diffy' it. Check that you end with a zero square. (This is called 'getting Zeroed')
2. Can you find a combination of starting numbers that leads to MORE than five Diffy Squares?
3. What happens if you don't choose whole numbers (for example decimals - or even pi)? Does this create more Diffy Squares before you get Zeroed?

### ULTRA-CHALLENGE

In the ultra-challenge you are only allowed to use whole numbers between 1 and 50. Can you find a combination of numbers that creates TEN Diffy squares?

### GENIUS-CHALLENGE

Can you find the combination of four whole numbers between 1 and 50 that creates thirteen Diffy Squares? (There may only be one combination that works - if you can find more than one combination, give yourself extra genius points).