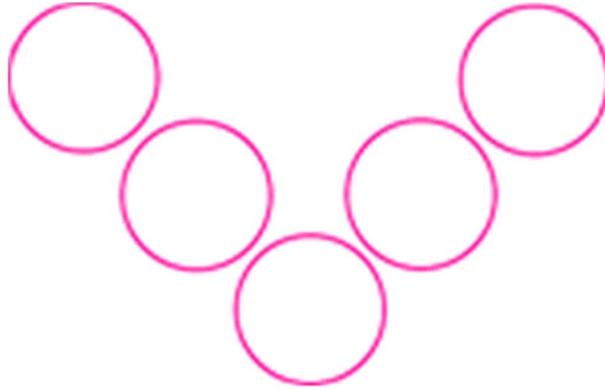Magic Vs

Place each of the numbers 1 to 5 in the V shape below so that the two arms of the V have the same total.

How many different possibilities are there?
What do you notice about all the solutions you find?

Can you explain what you see?

Can you convince someone that you have all the solutions?

What happens if we use the numbers from 2 to 6? From 12 to 16? From 37 to 41? From 103 to 107?

What can you discover about a V that has arms of length 4 using the numbers $1-7$?

Neighbourly Addition

As I walked down the street this morning, I noticed that all of my neighbours' house numbers were odd!

I added three house numbers together as I walked past: 7 + 9 + 11 = 27
Further down the road, I passed some bigger numbers. I added another set of three neighbouring house numbers: 15+17+19 = 51

Can you find some other totals I could make, by adding together the house numbers of three (odd) next-door-neighbours?

Once you've found a few totals, here are some questions you might like to explore:

Is there anything special about all the totals?
Is there a quick way to work out the total?
Can you predict what would happen if I walked down the other side of the street instead (where all the houses have even numbers)?

Are there any patterns if I add together four house numbers instead of just three?
Or five house numbers?
Or...

Can you explain and justify the patterns you have noticed?

Strike it Out for Two

Age 5 to 11

Here's a game to play with an adult!

How do you play?
You'll need an adult to play with.
You'll also need a number line from 0 to 20, like the one above. You can find some of these here.

The adult chooses a number on the line and crosses it out.
They then choose a second number and cross that out too.
Finally, the adult circles the sum or difference of the two numbers and writes down the calculation.

For example, the adult's go could look like this:

3 + 8 = 11

You must start by crossing off the number that the adult has just circled.
You then choose another number to cross out, and then circle a third number which is the sum or difference of the two crossed-off numbers. You also writes down their calculation.

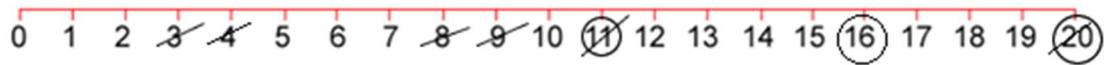For example, once you have had a turn, the game could look like this:

3 + 8 = 11
11 + 9 = 20

Play continues in this way with each player starting with the number that has just been circled.

For example, the adult could then have a turn which left the game looking like this:

3 + 8 = 11
11 + 9 = 20
20 - 4 = 16

The winner of the game is the player who stops their opponent from being able to go.

What is your strategy for winning?
Can you cross out all the numbers in one game? How do you know?
What is the biggest number of numbers you can cross out?