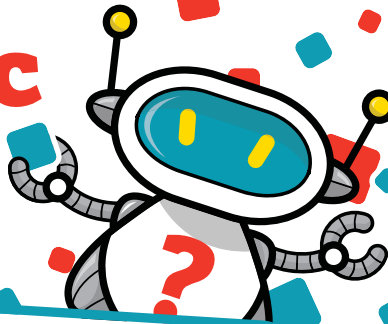
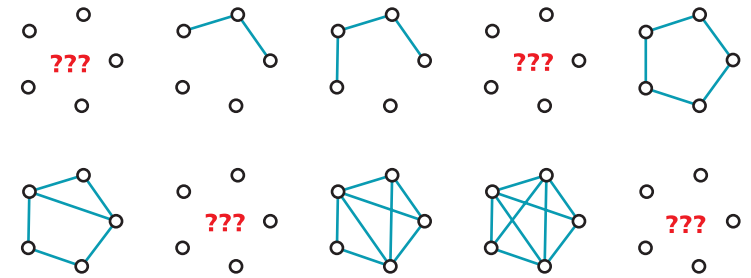


# Lanbot's Logic Puzzles



## Missing edges

Fill-in the missing edges on the shapes pictured here.



## Break the binary code

- The binary number system uses two digits: 0 and 1 unlike the decimal system which uses 10 digits: 0 to 9.

$8 = 2^3$	$4 = 2^2$	$2 = 2^1$	$1 = 2^0$	Decimal number
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	0	0	0	8
1	0	0	1	9
1	0	1	0	10

Binary is very useful in computer systems and electronics.

The table on the right can be used to help convert decimal numbers into binary.

For example, 9 in binary is written as 1001.

Fill-in the missing binary numbers in the table below:

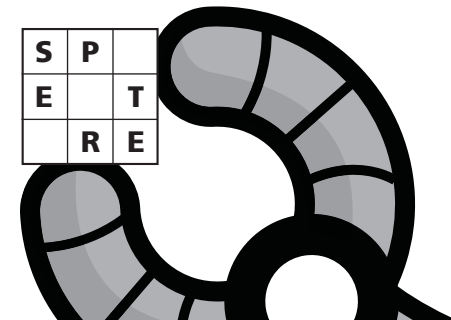
2	3	5	7	11	13	17	19	23
10	11	101	111	1011		10001	10011	

Do you know what makes this sequence of numbers special?

## Word Square

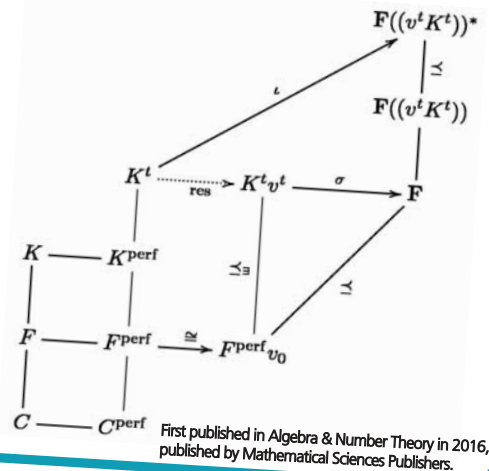
Identify the missing letter on the right.

S	P	
E		T
	R	E



**Dr Sylvie Ancombe** is a Maths Lecturer at UCLan, specialising in Logic and Algebra. She loves Maths puzzles of all kinds, but especially logic puzzles.

Can you work out the answers to Sylvie's puzzles?



## Lanbot's Toy Shop

Lanbot and Sylvie have some bouncy balls to sell at the Lancashire Science Festival. The balls are stacked in a regular tetrahedron (a triangular – based pyramid).

As in the picture, there are five balls along each side.

### 1. How many balls are in the stack?

In the morning, they sell 80% of the bouncy balls, at a price of 40p per ball.

### 2. How much money have they received?

At lunch time they start playing but then two of the balls roll away. In the afternoon all the remaining bouncy balls are sold at 30p each. They decide to divide the money equally between them.

### 3. How much money do they each have?

