Whizz Online Maths Extravaganza Puzzle Sheet

We hope you had a blast attending the maths extravaganza.

The fun isn't over just yet, though!

Here are some questions to ponder, based on the activities we did in the session.

Can Sim end in a draw?

Sim is a two-player game where players take it in turns to draw lines connecting any two points on a hexagon (using different colours).

The first person to make a triangle with three of their own colour loses!

Note the triangle must join three points on the hexagon; smaller triangles don't count.
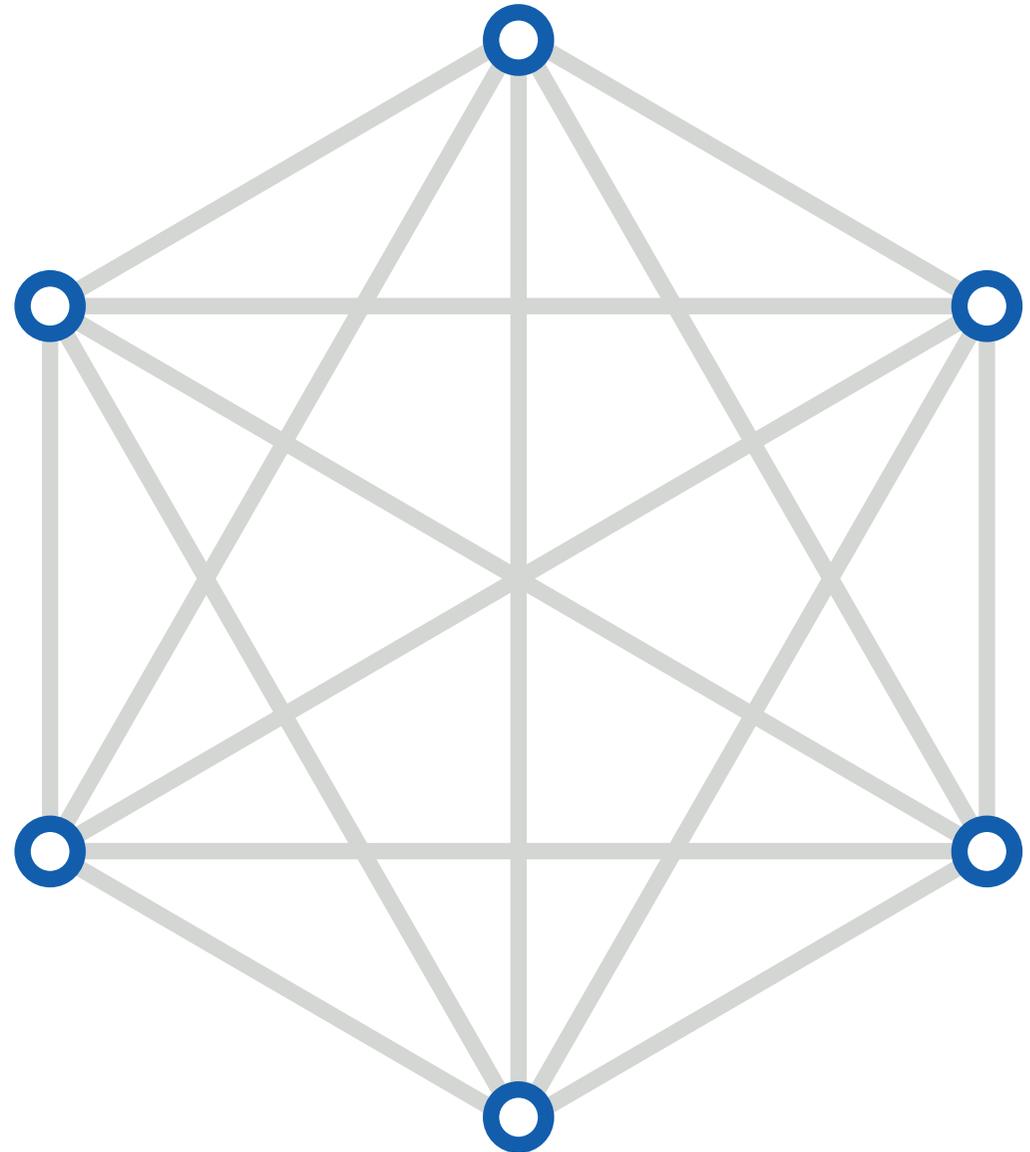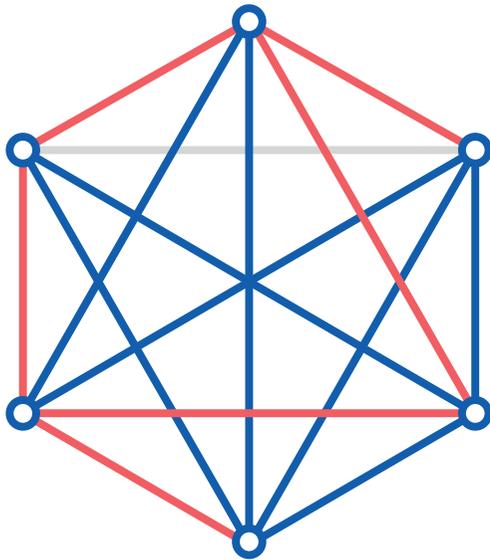
Can Sim end in a draw?

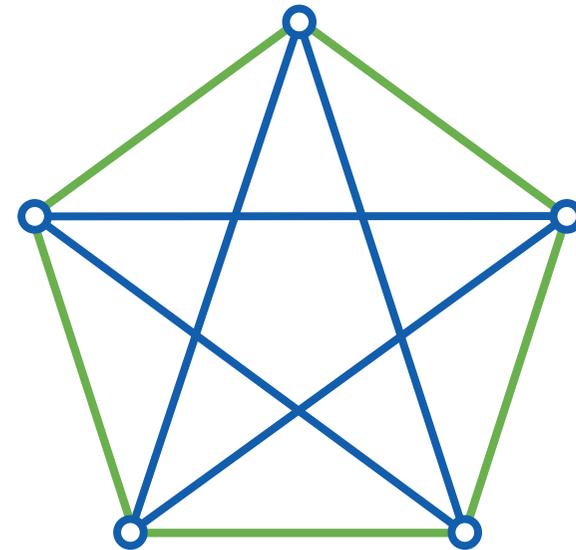**Q1. Is it better to go as Player 1 or Player 2? Why?**

Here is a completed attempt at the game.

Q2. Player 2 has just lost – can find spot their blue triangle?

In fact, it seems like every game ends in a win for one of the players. Which makes you wonder - is a draw possible in Sim?
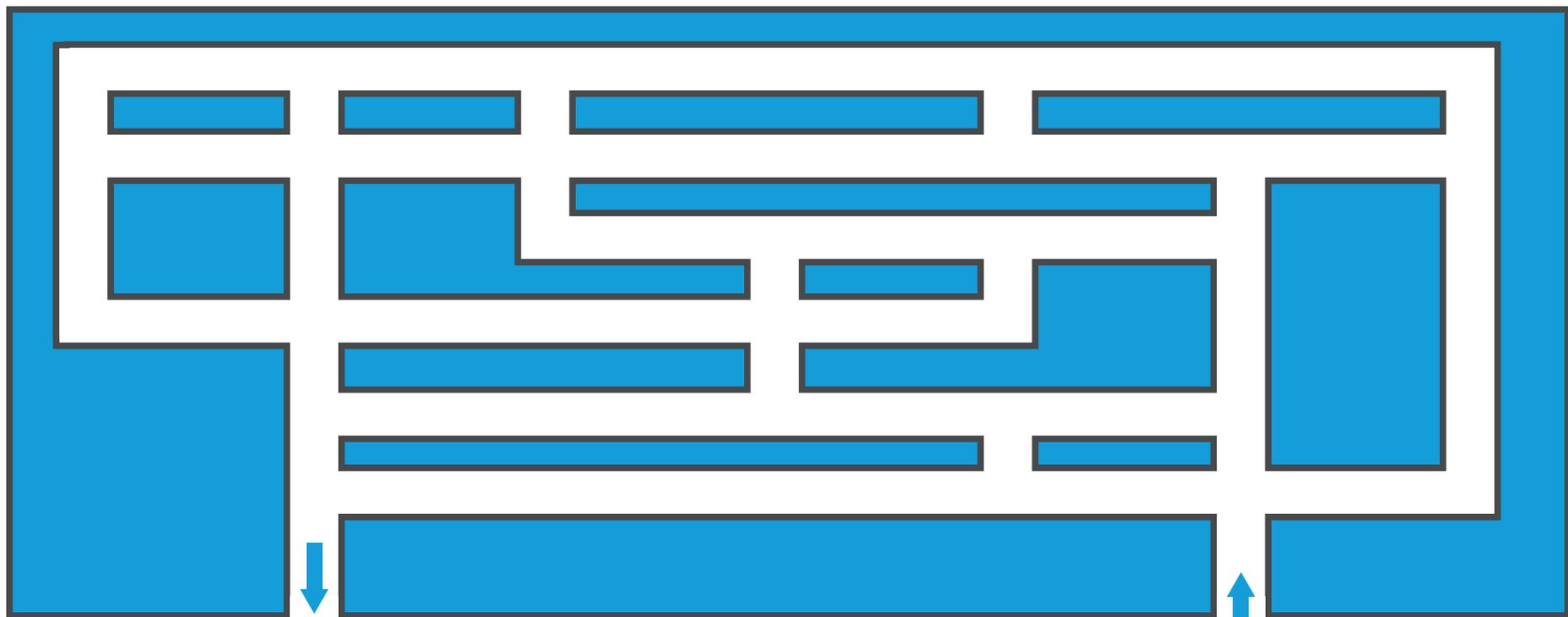
It definitely is if we're playing on a pentagon, as the following picture shows:

Q3. Your ultimate challenge: either show that a draw is possible on a hexagon or explain why it is impossible.

The a-mazing puzzle

Here is the maze we navigated through in the session. See if you can remember how to trace a path to the exit. Remember, no left turns allowed!
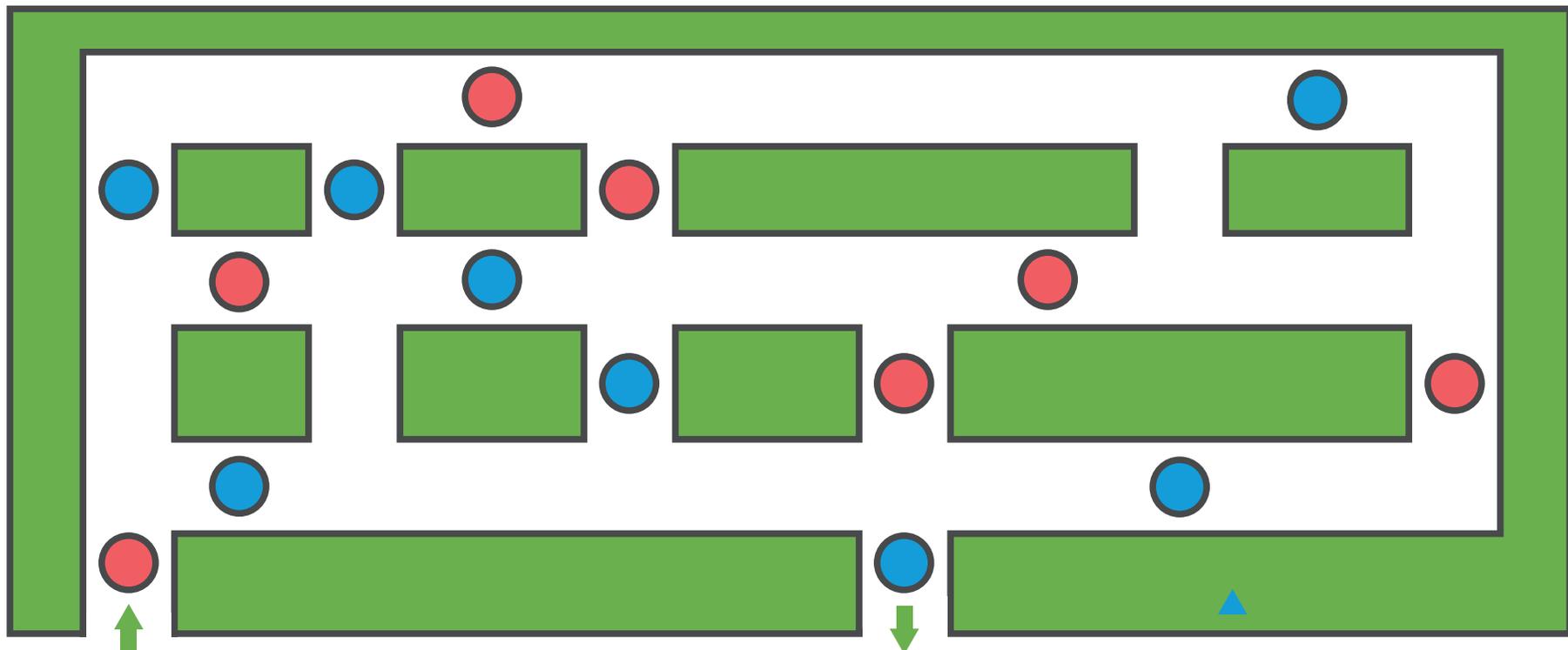

GOAL!

No-Left-Turn Maze
Enter here, then follow paths to GOAL. Don't make any left turns or U-turns.
© 2009 by Robert Abbott

You can find these puzzles and many more like them for free at **www.logicmazes.com**

And here is another maze - this time, you have to alternate the colours you pass through (red-blue-red-blue...)

Enter here and follow paths to GOAL.
Go past dots in this order: red, blue, red, blue etc

GOAL!

You can find these puzzles and many more like them for free at www.logicmazes.com

A bit of maths card magic

In the Double Location trick, you ask two volunteers to each choose a card and shuffle them back into their pile. Using a bit of maths you can guess both of their cards!

Click here to see a short video of Dr Junaid explaining how the trick works.

The main idea is to pre-arrange the deck of 52 cards into two roughly equal piles so that in each pile, all the cards have something in common. In our trick, the first pile had all the odd-numbered cards and the second pile hard all the even-numbered cards (remember Ace=1, Jack=11, Queen=12, King=13).

Practice the trick and when you feel ready and confident, go ahead and amaze your friends and family!

Something for you to think about: How else could we divide the deck into two piles? Think about what other properties of the numbers 1-13 we might use.