Mathematical Enrichment Class

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- There are three initial enrichment classes on Saturday 30 January, 6, 13 and 20 February

- On Saturday 27 February there will be a selection test, at the end of which the best 40-50 students will be invited for more intense training in view of participation in the Irish Maths Olympiad.

- This event will take place at a national level on Saturday 23 April 2016. The best six pupils at the Irish Maths Olympiad will represent the country at the International Maths Olympiad which will take place in Hong Kong between 5-16 July 2016.

- Suppose a hacker can try 1000 passwords in one second.

- Suppose there are 60 possibilities for each character in a password.

- How long will it take a hacker to check all passwords with two characters?

- With three characters?

- How about with eight characters?

A password with two characters ** has 60 choices for each *

So there are 60x60=3600 possible passwords.

3.6 seconds to try them all.

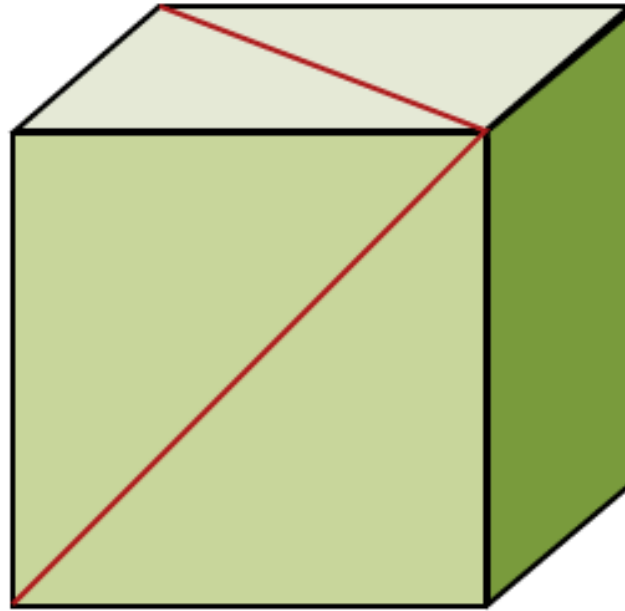With three characters there are $60^3 = 216,000$

It would take 216 seconds = less than 4 minutes.
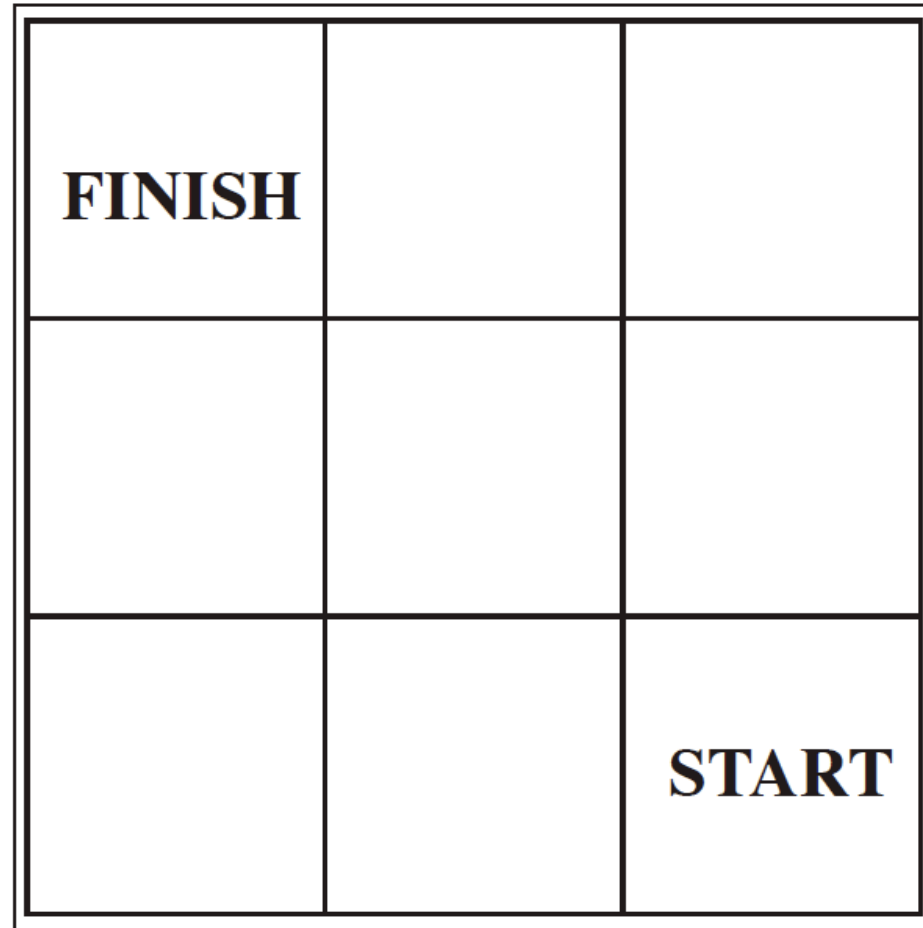
With eight characters there are 60^8 passwords.

This is 167961600000000 which would take over 5,000 years!

What is the angle between the two red lines?

Heads go up, Tails go left. If you go off, you lose. What are the chances of winning?

FINISH		
		START

List Possibilities

WIN	LOSE
HHTT	HHHH
HTHT	HHHT
…	…

A Hat Game

A group of N people are in a room. Each person is randomly given either a red hat or a blue hat.

Each person cannot see their own hat, but can see all other hats. Each person must guess the colour of their own hat. They all must guess at the same time. If they all guess correctly then they win a billion euro each. If anyone guesses incorrectly they win nothing. Before the hats are given out, the group may decide on a strategy. Once the hats are given out, no communication is allowed.

What would be the best strategy? What are the chances of that strategy working?

- 3 people in a room. Same deal with the hats, except this time they may also pass. They win as long as nobody guesses incorrectly, and at least one person guesses correctly.

- What is the best strategy? What are its chances of working?

I colour edges red, you colour green.
We take turns. If you make a triangle in
your own colour, you lose.
Can it end in a draw?

Hexagon