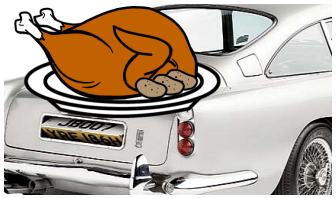
x-maths Bond

December 14th 11am, English speaking school of Lapland, Finland

Both the school and the weather recognised that Christmas was just around the corner. The thickening snow provided the perfect backdrop for the festive tunes provided by the school choir. Miss Brosnan was in room 25 busily introducing the Koch snowflake fractal to her Y11 class. "Helge von Koch was born in Sweden. His repeating pattern of equilateral triangles..."



Number Plate

abcde is a 5-digit number.

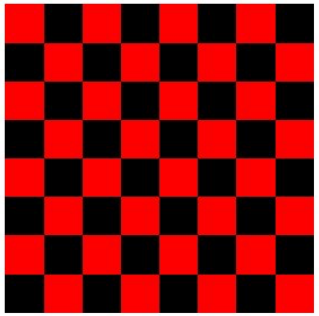
ab is a Triangle Number
bc is a Fibonacci Number
cd is a Triangle Number
de is a Fibonacci Number
cba is also a Fibonacci Number

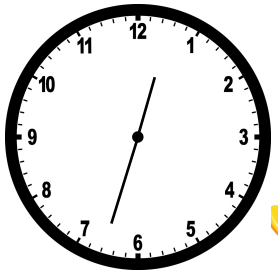
Miss Brosnan eventually got to the crux. "Koch's snowflake is constructed by dividing each side of an equilateral triangle into 3 equal parts and then adding an equilateral triangle to the middle part of each side. This process, known as an iteration, is repeated on each side of the new shape and then again indefinitely. If each side of the initial equilateral triangle is 81cm, what is the perimeter of the shape after 4 iterations?"

Mathematical outrage was prevalent across most of Europe, Northern Africa and The Middle East. The school inspectre continued with his routine, regardless.

Wrapping Shaper

How many squares?





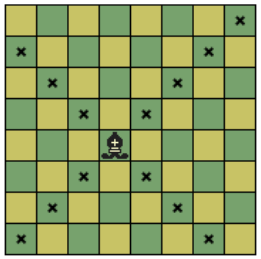
12:33pm precisely

Jangle Bells

Display Dismay

The mean of the following numbers is 9

65 7 27 3 61



Chess Nuts

Find the minimum number of bishops that can be placed on a chess board in such a way that all squares on the board, **including occupied squares**, are attacked by at least one bishop.