44 = 4^3 + 1

44 = 4 \cdot 11 = 2 \cdot 22 = 2 \cdot 2 \cdot 11

Six objects in a row:
there are 44 ways to rearrange them
so none are in the original place.

44 = 1^2 + 2^2 + 3^2 + 4^2 + 3^2 + 2^2 + 1^2, octahedral.

Euler's solution to finding a brick with integral edges and face diagonals is 44, 117, 240.

44 = 2^2 + 2^2 + 6^2 uniquely

![Diagram of a brick]

Nobody knows if there is such a brick with an integer space diagonal.
(Diagonals are 44, 117 and 240.)

\[ 44 = 5! \left( \frac{1}{0!} - \frac{1}{1!} + \frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} - \frac{1}{5!} \right) \]

Number of derangements of 5 items
A tribonacci number; octahedral