Why is there
\[
\frac{8! \cdot 3^8 \cdot 12! \cdot 2^{12}}{3 \cdot 2 \cdot 2}
\]
= 
43252003274489856000
combinations of
Rubik’s cube?

If you are curious,
take Math 415/CS 415
in Fall 2009.

http://www.ms.uky.edu/~jrge/415/