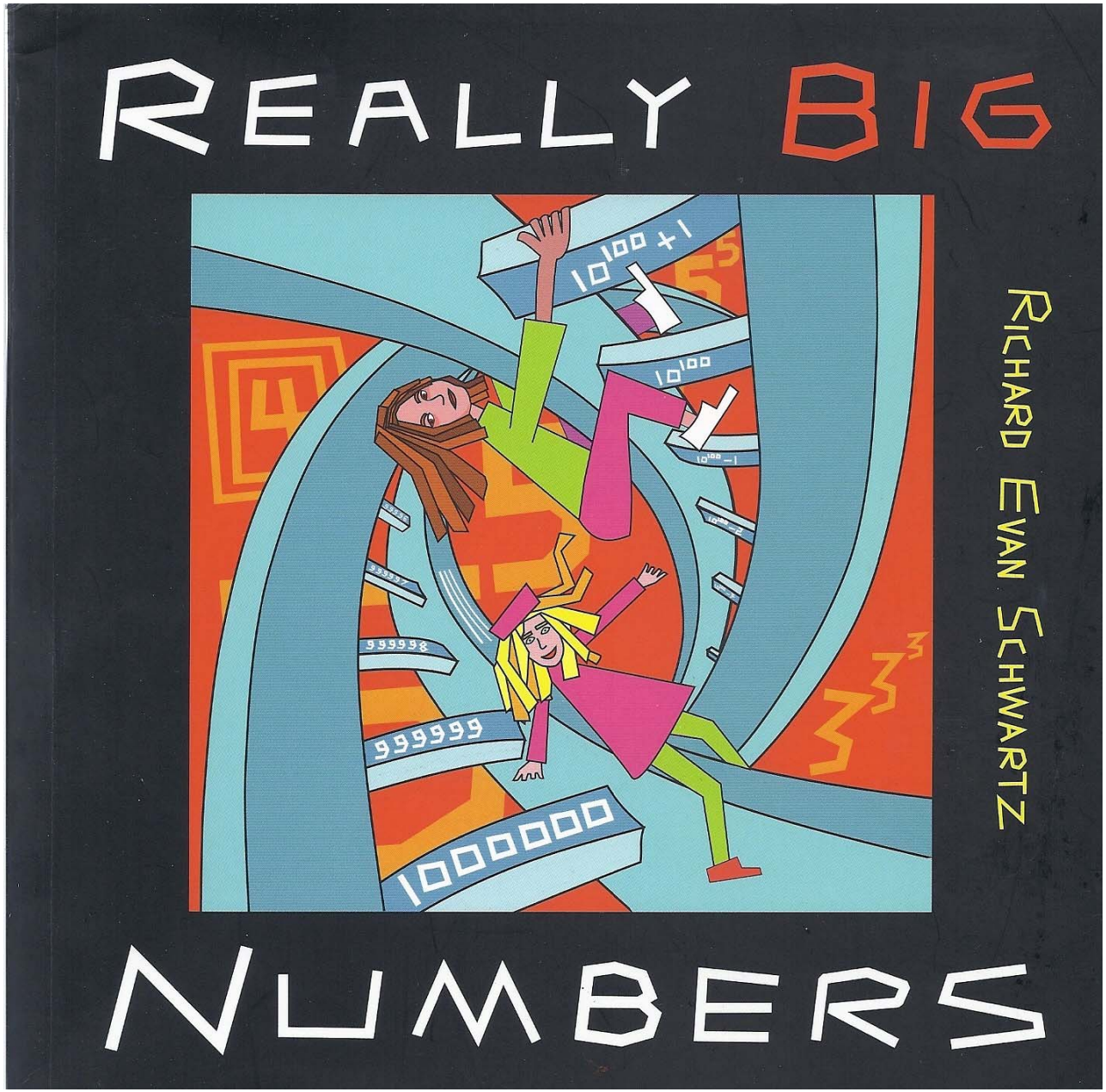


This power point was imaged by Dr. Jane Long and come from *Really Big Numbers* by Richard Evan Schwartz.

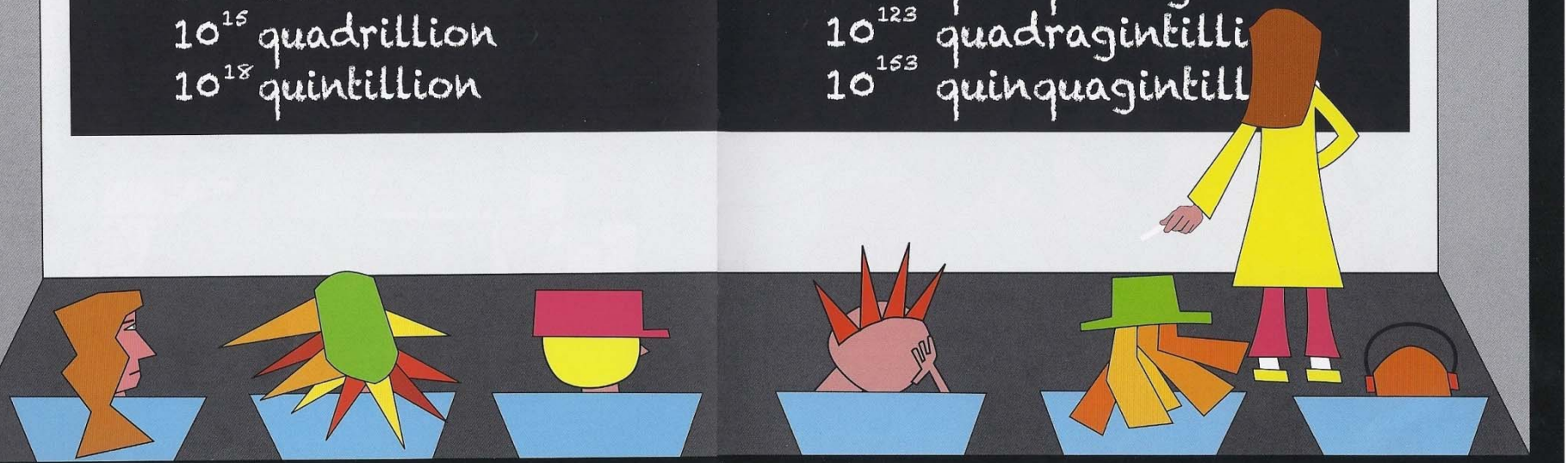

This book isn't something that you have to read all at once, or even all in one year. Just read as far as it makes sense and then save the parts you don't understand for later.
OK, now for the numbers...

Quadrillion and quintillion are part of a list of funny names for some of the powers of 10.

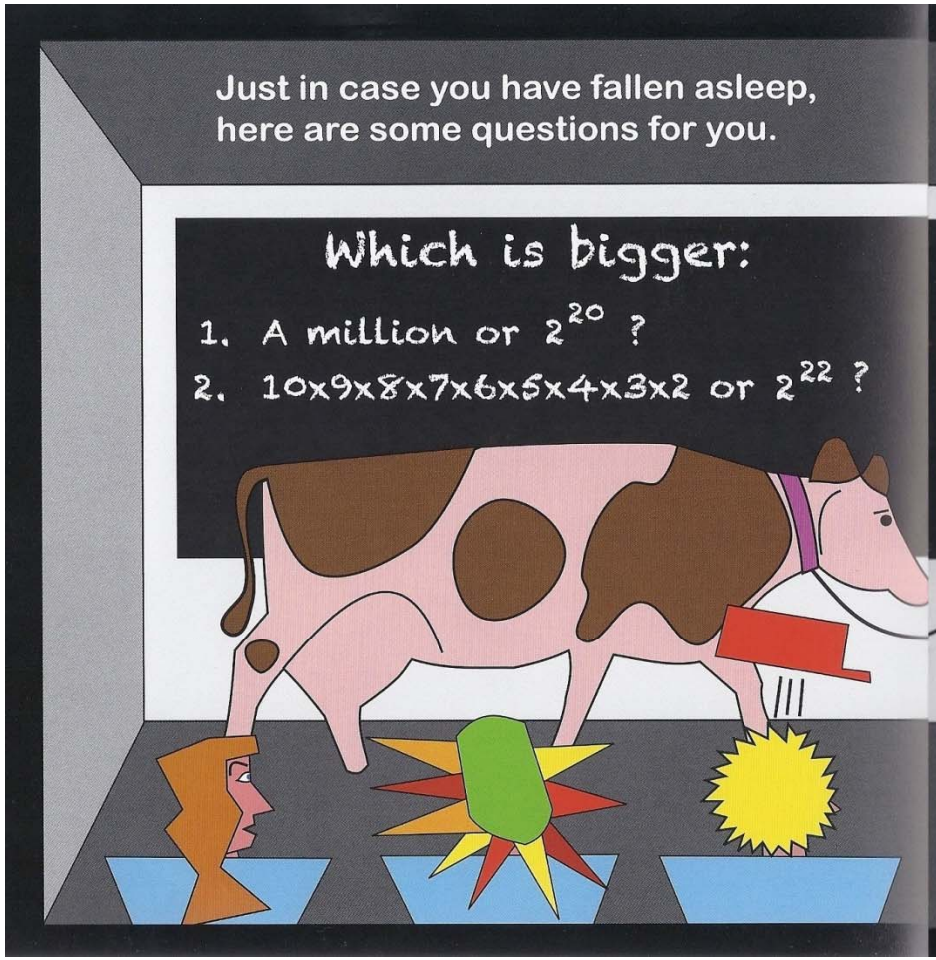
10^{6} million
10^{9} billion
10^{12} trillion
10^{15} quadrillion
10^{18} quintillion

Here, let me skip ahead some and show you the names of a few really big ones.

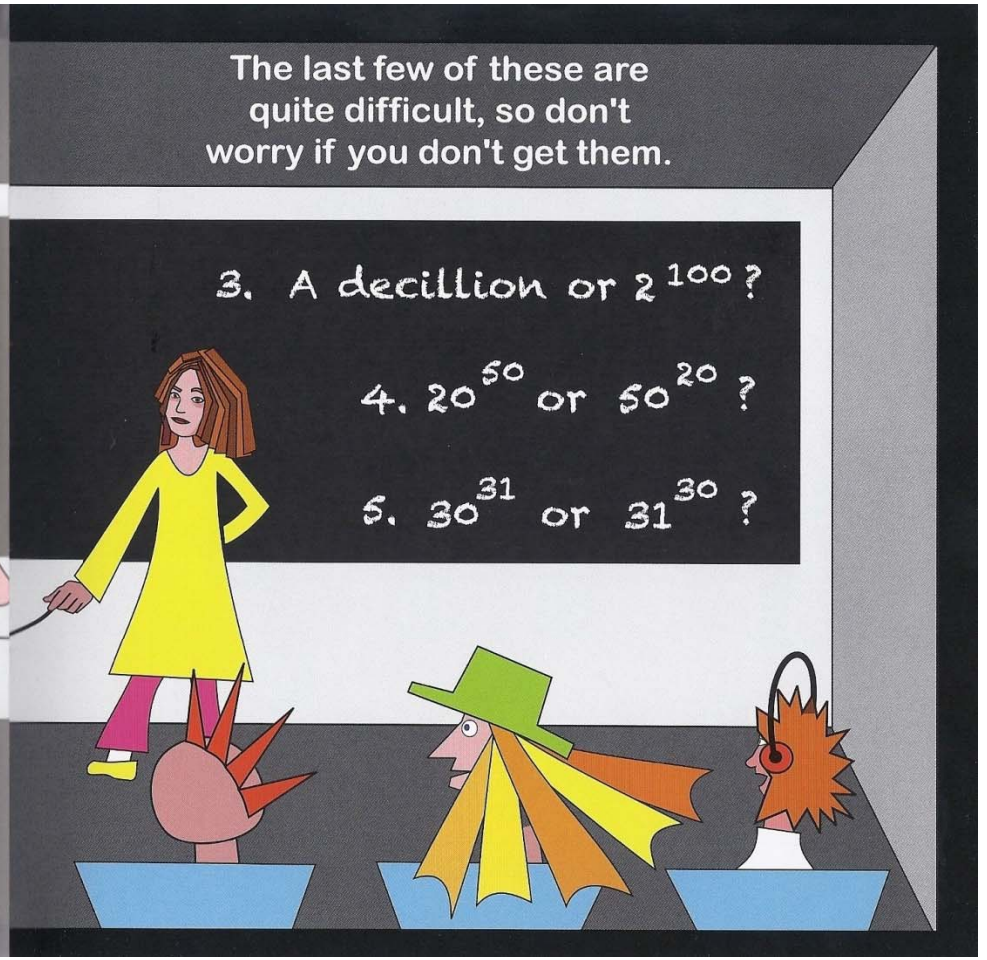
10^{78} quinquavigintillion
10^{93} trigintillion
10^{108} quinquatrigintillion
10^{123} quadragintilli
10^{153} quinquagintill



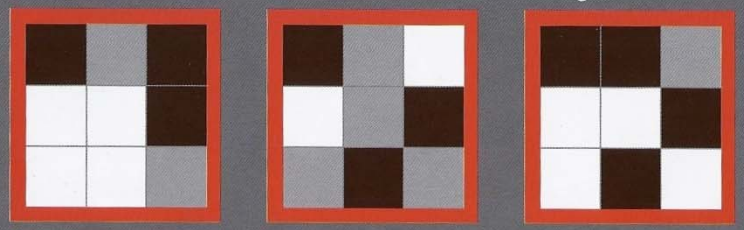
Just in case you have fallen asleep,
here are some questions for you.



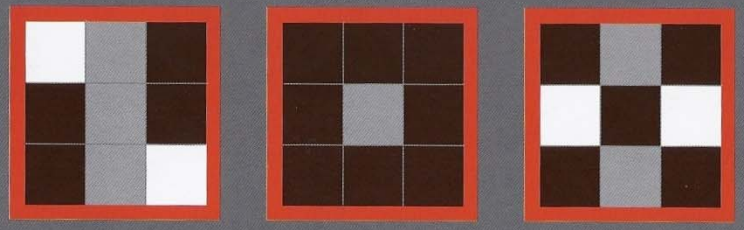
The last few of these are
quite difficult, so don't
worry if you don't get them.



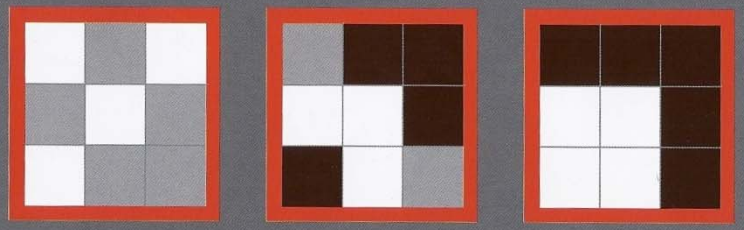
There are about 20,000 ways



to color the squares

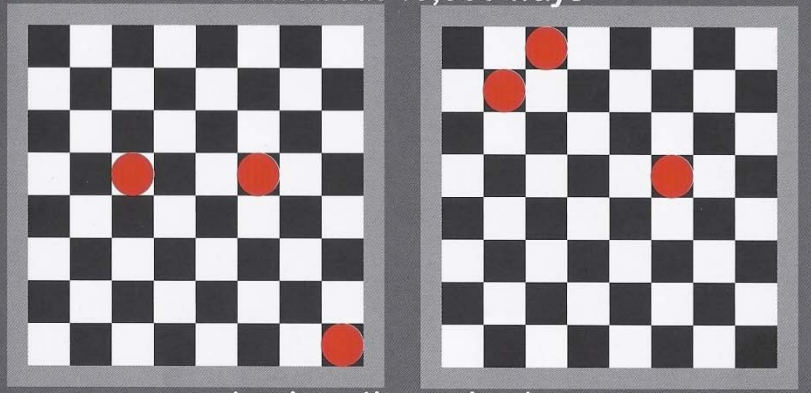


of a tic-tac-toe board

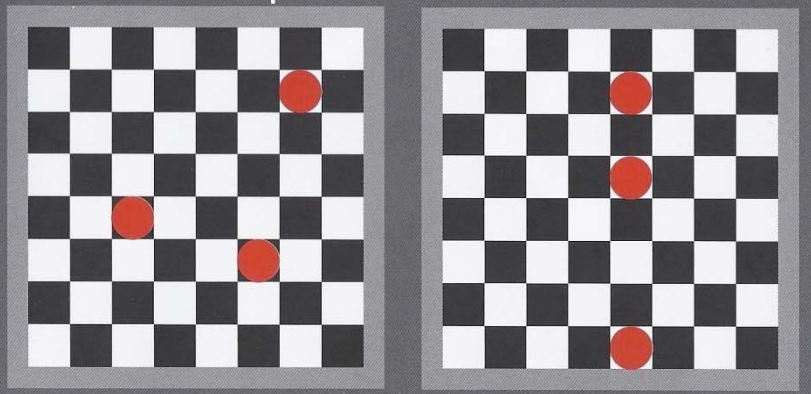


using three colors...

and about 40,000 ways

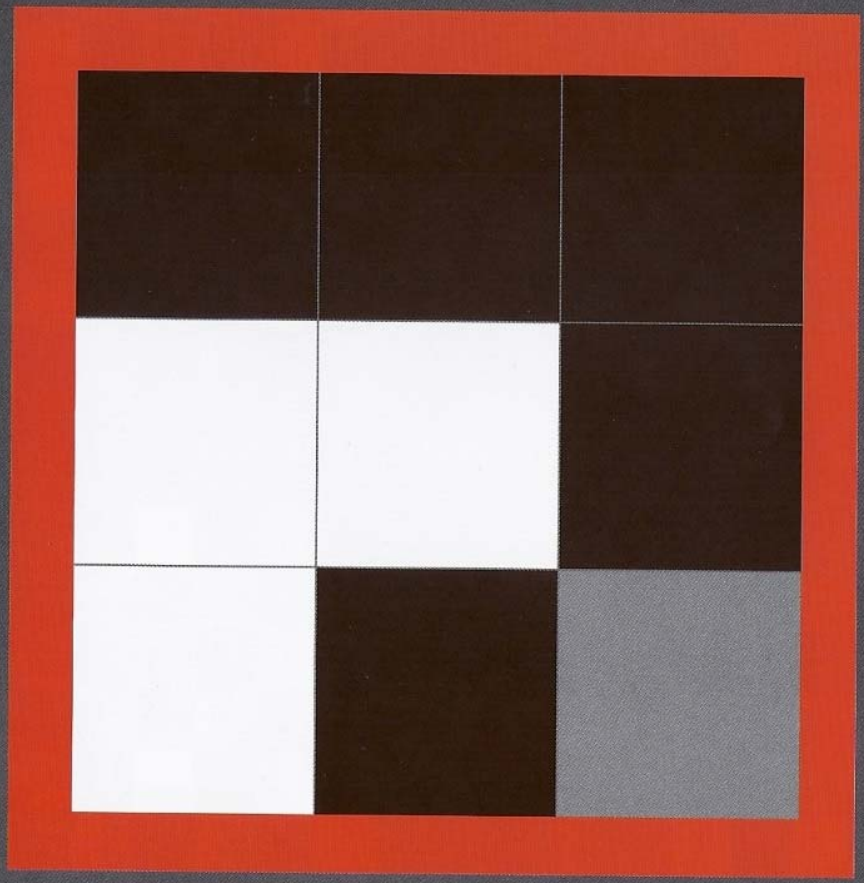


to place three checkers



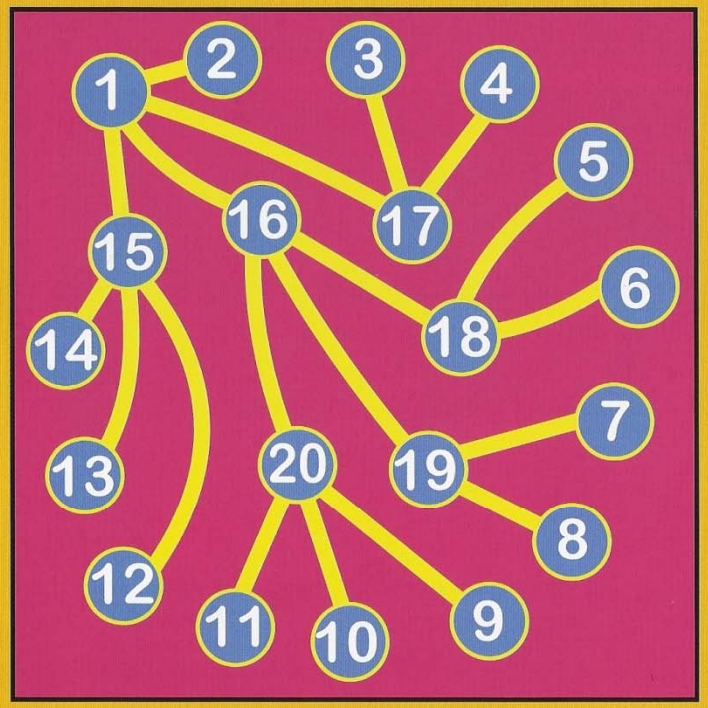
on a checkerboard.

You know, when I said that there are about 20,000 patterns like this...



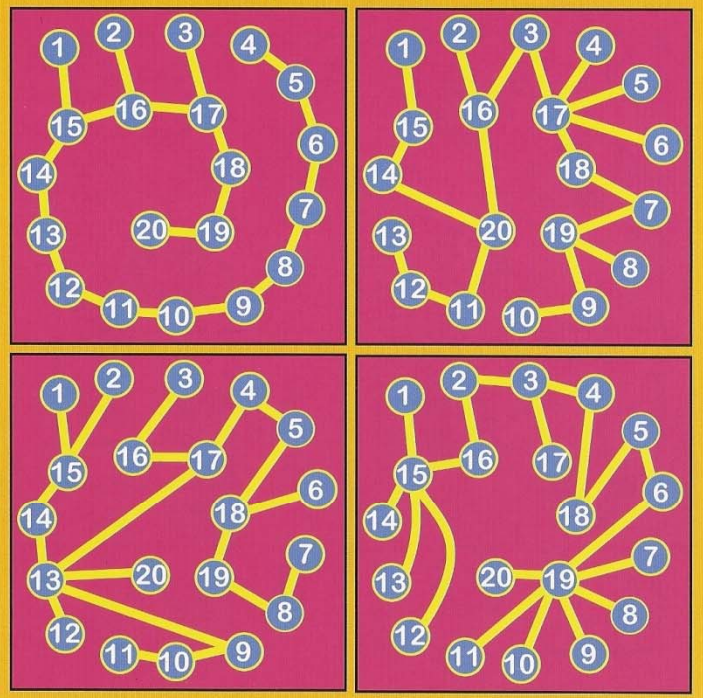
I was hoping that you would try to figure out exactly how many patterns there are.

There are about 262
sextillion (262×10^{21}) ways...



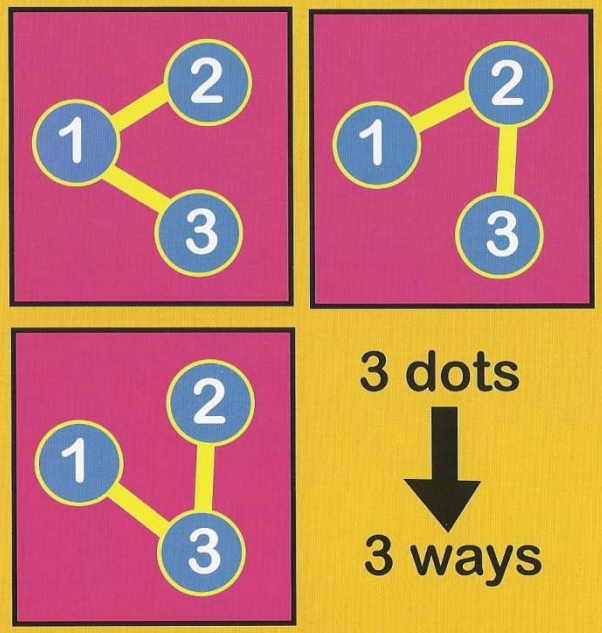
of connecting 20 dots
without making loops.

Can you figure out
exactly how many ways?



This is really a very
hard question, so...

I'm going to help you solve it by telling you the best trick I know for solving math problems.

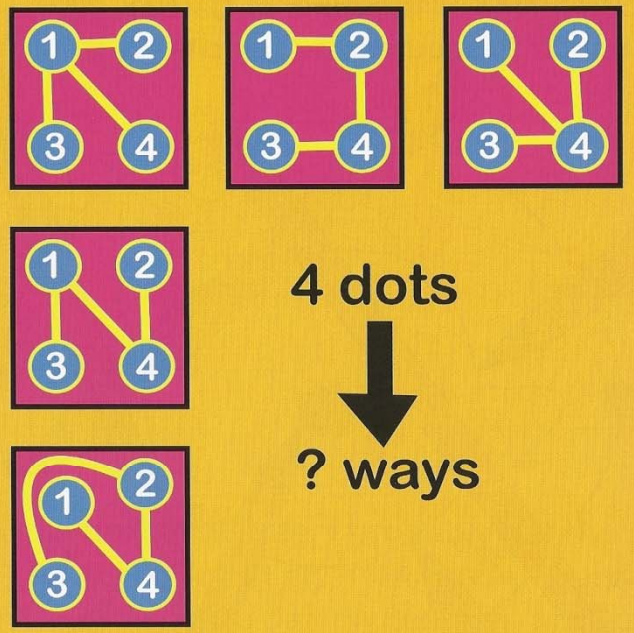


3 dots

3 ways

If you want to solve a problem involving big numbers, try it first with small numbers.

There are just 3 ways to do it for 3 dots, and here are some of the ways for 4 dots.



4 dots

? ways

The answer for 20 dots, about 262 sextillion, is pretty close to the famous...