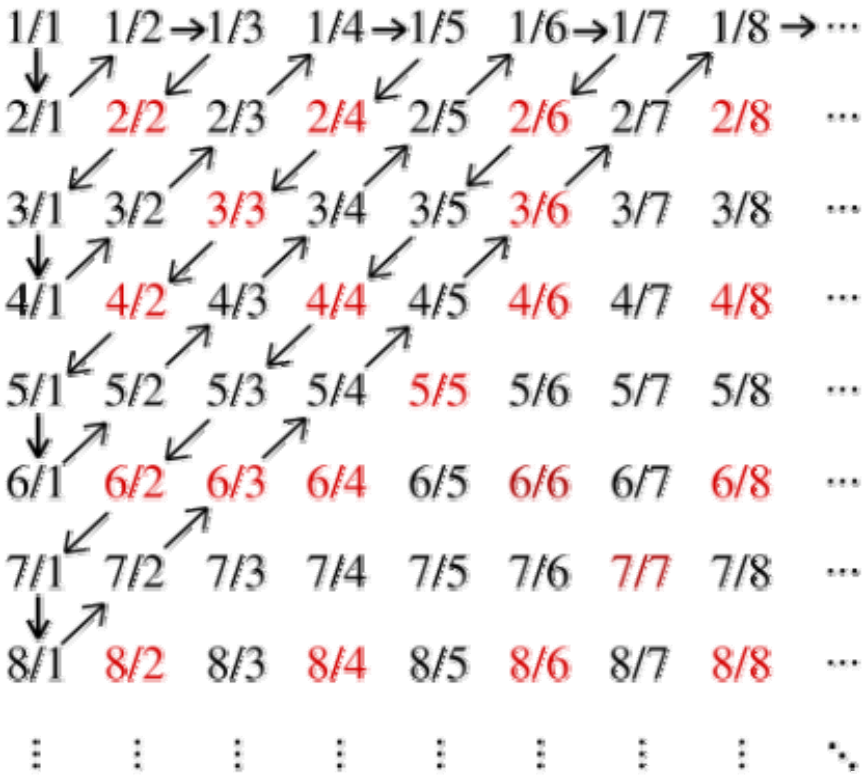
Here are interesting things I found:

“The decimal expansion of a rational number is eventually periodic (in the case of a finite expansion the zeroes which implicitly follow it form the periodic part).” This is another answer to the question about 1/3 = .33333… An irrational number is not periodic.

“It is always possible to find another rational number between any two members of the set of rationals. Therefore, rather counterintuitively, the rational numbers are a continuous set, but at the same time countable.” This is very strange! This is another example how the logic of mathematics leads to things that do not make sense!

Here is another way to prove the one-to-one correspondence between the set of rational numbers and the set of integers. The red colors are fractions that can be reduced.