
Problem of the Week

Solution One

Using exactly four 4s (and no other digits at all), the standard arithmetic operations, and whatever standard mathematical notation you like (such as fraction bars, square roots, factorials, decimal points, parentheses and exponents), show how to express all of the numbers from 2 to 10. Concatenation is also acceptable, meaning that, if you wish, you may take two of the 4s and turn them into the number 44.

SOLUTION: Here is one possible set of solutions. They are not unique, and I do not claim that they are the simplest possible solutions. They are just the ones I thought of when it came time to write this up.

$$\begin{array}{ll} (4 + 4) - 4 - \sqrt{4} = 2 & \frac{4!}{\frac{4^2}{4} + 4} = 3 \\ 4(4 - 4) + 4 = 4 & \frac{4! - 4}{\sqrt{4} + \sqrt{4}} = 5 \\ \frac{4!}{(4 - 4) + 4} = 6 & \frac{4! + 4}{4} = 7 \\ (4 + 4) \left(\frac{4}{4}\right) = 8 & (4 + 4) + \frac{4}{4} = 9 \\ \frac{44 - 4}{4} = 10 & \end{array}$$

For alternative solutions, and for ways of using four fours to obtain all the numbers up to 116 (except, oddly, for 113, which appears to be impossible given the rules of the game), feel free to visit this website: <http://www.wheels.org/math/44s.html>