

π day 2021 digit puzzle

Make the year 2021 using the first digits of π (including 3) exactly once together with the following operations (in addition to parentheses):

- Standard operations: $+$, $-$, \times , \div
- Square root of a number: $\sqrt{\square}$
- Exponentiation of two numbers: \square^{\square}
- Radicals: $\sqrt[n]{\square}$
- Negation of a number: $-\square$
- Factorial: $\square!$
- Percentage: $\square\%$
- Decimal (only with an original digit): $.d$
- Repeating decimal (only with an original digit): $\overline{.d}$

Your goal is to use as few digits of π as possible.

Challenge 1: No additional restrictions. For example, you can get 2021 using:

$$2021 = (3!) \times 1 \times (4!) \times 5 \times \sqrt{9} - 5! - 6 \times 3 - 2 + 1$$

This uses the first 10 digits: 3.141592653

Challenge 2: The digits of π you use must be in order. For example, you can get 2021 using:

$$2021 = (3!) \times 1 \times (4!) \times 1 \times 5 \times \sqrt{9} - 2 \times 6 \times 5 - (3!) \times 5 - 8 \times (9 - 7 + \sqrt{9}) - 3^2$$

This uses the first 17 digits: 3.1415926535897932

Of course, neither of these are optimal. How few digits can you use?