



Problem of the Week

Problem E

One Thousand Zeros

The product of the integers from 1 to n can be written in abbreviated form as $n!$ and we say " n factorial". So $n! = n \times (n - 1) \times (n - 2) \times \dots \times 3 \times 2 \times 1$.

For example, $6! = 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$, and

$$11! = 11 \times 10 \times 9 \times \dots \times 3 \times 2 \times 1 = 39\,916\,800.$$

Note that $6!$ ends in 1 zero and $11!$ ends in 2 zeroes.

Determine the smallest possible value of n such that $n!$ ends in exactly 1000 zeros.

