Problem of the Week
Grade 7 and 8

Powerful Factorials At Work!

The product of the positive integers 1 to 3 is $3 \times 2 \times 1 = 6$ and can be written in an abbreviated form as 3!. We say 3 *factorial*. So $3! = 6$.

The product of the positive integers 1 to 17 is $17 \times 16 \times 15 \times \cdots \times 3 \times 2 \times 1$ and can be written in an abbreviated form as 17!. We say 17 *factorial*. The $\cdots$ represents the product of all the missing integers between 15 and 3.

In general, the product of the positive integers 1 to n is $n!$. Note that $1! = 1$.

Determine the units digit in the sum $1! + 2! + 3! + \cdots + 18! + 19! + 20!$.