Problem of the Week

Problem C

How It Ends

The product of the positive integers 1 to 4 is

$$4 \times 3 \times 2 \times 1 = 24$$

and can be written in an abbreviated form as 4!. We say "4 *factorial*". So $4! = 24$.

The product of the positive integers 1 to 16 is

$$16 \times 15 \times 14 \times \cdots \times 3 \times 2 \times 1$$

and can be written in an abbreviated form as 16!. We say "16 *factorial*".
The $\cdots$ represents the product of all the missing integers between 14 and 3.

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

Determine the tens digit and units (ones) digit of the sum

$$1! + 2! + 3! + \cdots + 2019! + 2020! + 2021!$$