

# What is the Sum?

Submission deadline: May 28<sup>th</sup> 2021

Find

$$\frac{1}{2!} + \frac{2}{3!} + \frac{3}{4!} + \cdots + \frac{2020}{(2021)!}$$

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Discussion:

Let

$$a_n = \frac{n}{(n+1)!}$$

Then, it is easy to see that

$$a_n = \frac{1}{n!} - \frac{1}{(n+1)!}$$

Thus

$$\sum_{n=1}^{2020} a_n = 1 - \frac{1}{2021!}$$