Unknown Summations

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ABSTRACT. We introduce a set of finite and infinite summations which looks like were never considered yet.

1. Let us introduce the following finite summation:

$S_1(2019) = 1 + 2^3 + 3^4 + 4^5 + ... + 2019^{2020}$

and, more generally,

$S_1(n) = = 1 + 2^3 + 3^4 + 4^5 + ... + n^{n+1} = \sum_{i=1}^{n} i^{i+1}$

The corresponding infinite summation (series) is the following:

$S_1 = 1 + 1/2^3 + 1/3^4 + 1/4^5 + ...$

2. Let us introduce the following finite summation:

$S_2(2019) = 1 + 2^2 + 3^3 + 4^4 + ... + 2019^{2019}$

and, more generally,

$S_2(n) = = 1 + 2^2 + 3^3 + 4^4 + ... + n^n = \sum_{i=1}^{n} i^i$

The corresponding infinite summation (series) is the following:

$S_2 = 1 + 1/2^2 + 1/3^3 + 1/4^4 + ...$

3. Let us introduce the following finite summation:

$S_3(2019) = 1 + 2 + 3^2 + 4^3 + ... + 2019^{2018}$

and, more generally,

$$S_3(n) = = 1 + 2 + 3^2 + 4^3 + ... + n^{n-1} = \sum_{i=1}^{n} i^{i-1}$$

The corresponding infinite summation (series) is the following:

$$S_3 = 1 + 1/2 + 1/3^2 + 1/4^3 + ...$$

4. Conclusions.

Despite the above-introduced summations and series looks very simple, they were never considered elsewhere yet.

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