

PROOF (Definition XI)

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$$\begin{aligned} & 1 + 2 + 3 + 4 + \cdots + \infty \\ &= \lim_{N \rightarrow \infty} \sum_{n=1}^N n = \lim_{N \rightarrow \infty} \frac{1}{2} n(n+1) \\ &= \frac{1}{2} \infty(\infty + 1) = \frac{1}{2} (-2)(-2 + 1) = 1 \\ &1 = \frac{5}{5} = \frac{-15}{5} = -3 = 2 = \frac{4}{2} = -\frac{1}{2} \\ &-\frac{1}{2} = \frac{1}{-2} = \frac{1}{3} = \frac{4}{12} = -\frac{1}{12} \\ &\therefore 1 + 2 + 3 + 4 + \cdots + \infty = -\frac{1}{12} \end{aligned}$$

That is all. (proof end)