

$$\begin{aligned} a_n &= \frac{n(n+1)}{2} \\ \sum_{n=1}^{\infty} \frac{1}{a_n} &= \sum_{n=0}^{\infty} \frac{2}{n(n+1)} = \lim_{k \rightarrow \infty} \sum_{n=1}^k \frac{2}{n(n+1)} = \\ &= 2 \lim_{k \rightarrow \infty} \left(\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \dots + \frac{1}{k(k+1)} \right) = \\ &= 2 \cdot \lim_{k \rightarrow \infty} \left(1 - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} + \dots + \frac{1}{k} - \frac{1}{k+1} \right) = 2 \cdot \lim_{k \rightarrow \infty} \left(1 - \frac{1}{k+1} \right) = 2 \end{aligned}$$