$$a_n = \frac{n(n+1)}{2}$$

$$\sum_{n=1}^{\infty} \frac{1}{a_n} = \sum_{n=0}^{\infty} \frac{2}{n(n+1)} = \lim_{k\to\infty} \sum_{n=1}^{k} \frac{2}{n(n+1)} =$$

$$= 2 \lim_{k\to\infty} \left(\frac{1}{1\cdot 2} + \frac{1}{2\cdot 3} + \frac{1}{3\cdot 4} + \cdots + \frac{1}{k(k+1)} \right) =$$

$$= 2 \cdot \lim_{k\to\infty} \left(1 - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} - \frac{1}{4} + \cdots + \frac{1}{k} - \frac{1}{k+1} \right) = 2 \cdot \lim_{k\to\infty} \left(1 - \frac{1}{k+1} \right) = 2$$