Proposition 0.0.1.

$$\lim_{n\to\infty} \frac{1}{n^2} = 0 \quad \text{for every } k = 0$$

$$\sum_{n=1}^{\infty} \frac{1}{n^2} \text{ converges, } \forall k$$

$$\sum_{n=1}^{\infty} \frac{1}{n^2} < \quad \text{since } k^2 > 0$$