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1ª ⑥ $\frac{n^2}{n+1} - \frac{n^2}{n+2}$

$$\lim_{n\to\infty} \frac{n^2}{n+1} - \frac{n^2}{n+2} =$$

Simplificando o termo geral da sequência:

utilizando a propriedade algébrica:

$$a + b = a\left(1 + \frac{b}{a}\right)$$

Portanto,

$$\frac{n^2}{n+1} - \frac{n^2}{n+2} = \frac{n^2}{n+1}\left(1 - \frac{\frac{n^2}{n+2}}{\frac{n^2}{n+1}}\right)$$

$$= \frac{n^2 \cdot n^2}{(n+2)(n+1)} //$$

Logo,

$$\lim_{n\to\infty} \frac{n^2}{n+1} - \frac{n^2}{n+2} = \lim_{n\to\infty} \frac{n^2}{(n+2)(n+1)}$$

Resolvendo o limite:

$$\lim_{n\to\infty} \frac{n^2}{(n+2)(n+1)} = \lim_{n\to\infty} \frac{n^2}{n^2+3n+2} = \lim_{n\to\infty} \frac{1}{1+\frac{3}{n}+\frac{2}{n^2}}$$

$$\frac{\lim_{n\to\infty}(1)}{\lim_{n\to\infty}\left(1+\frac{3}{n}+\frac{2}{n^2}\right)} = 1 //$$