

# AM 1 - TO

30/03

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## 1 Def de sussão q tende p + inf

$$u_n \rightarrow \infty \iff \forall M \exists p : n > p \implies U_n > M$$

## 2 indeterminação de zero \* inf

$$u_n \rightarrow \infty; v_n \rightarrow 0$$

$$u_n v_n$$

## 3 Exercicios

### 3.1 E1

$$u_n = \sqrt{n^2 + 2n} - n$$

$$u_n = n(\sqrt{1 + 2/n} - 1) = \frac{n(1 + 2/n - 1)}{\sqrt{1 + 2/n} + 1} = \frac{2}{\sqrt{1 + 2/n} + 1} \rightarrow 1$$

### 3.2 E2

$$a_n = \frac{n + \cos(n)}{n \ln(n + 1)}; b_n = \left( \frac{n^2 - 2n + 1}{n^2 + 2n + 1} \right)^n$$

$$a_n = \frac{n + \cos(n)}{n \ln(n + 1)} = \frac{1 + \cos(n)/n}{\ln(n + 1)} \rightarrow \infty$$

$$\begin{aligned} b_n &= \left( \frac{n^2 - 2n + 1}{n^2 + 2n + 1} \right)^n = \left( \frac{(n + 1)^2}{(n - 1)^2} \right)^n = \left( \frac{n + 1}{n - 1} \right)^{2n} = \left( \frac{n - 1 + 2}{n - 1} \right)^{2n} = \\ &= \left( 1 + \frac{2}{n - 1} \right)^{2n} = \left( \left( 1 + \frac{2}{n - 1} \right)^{n-1} \right)^2 \left( 1 + \frac{2}{n - 1} \right)^2 \rightarrow e^4 \end{aligned}$$