AM 1 - TO

30/03

Contents

1 Def de sussão q tende p + inf

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

2 indeterminação de zero * inf

$u_n \to \infty;\; v_n \to 0$
$u_n\, v_n$

3 Exercicios

3.1 E1

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

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

3.2 E2

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

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

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

$$= \left(1 + \frac{2}{n-1}\right)^{2\,n} = \left(\left(1 + \frac{2}{n-1}\right)^{n-1}\right)^2 \left(1 + \frac{2}{n-1}\right)^2 \to e^4$$