20112 6 – FAI – 5

Questions? Let hear!

("Is the sound good of my microphone?)

(a) $d(x_m, x_n)$

$B(?, R)$?

$B(x_m, R)$

$N(\varepsilon)$ finite

($\varepsilon > 0$ is given) $\exists \boxed{N}$ $\forall_{n,m} > N$

$d(x_m, x_n) < \varepsilon$

$\varepsilon < 1$

$d(x_m, x_N)$

$d(x_m, x_n) \leq d(x_m, x_N) + d(x_N, x_m)$

$m, n > N$ $\to$ $d(x_m, x_n) < 1$

$m, n < N$

$1 \leq m \leq N$
$1 \leq n \leq N$

$$d(x_m, x_n) \leq \underbrace{d(x_m, x_N)}_{M} + \underbrace{d(x_N, x_n)}_{M}$$

$$\underline{\underline{d(x_m, x_n)}} \le \underbrace{\underbrace{d(x_m, x_N)}_{M} + \underbrace{d(x_N, x_n)}_{1}}$$

$\underline{\underline{m \le N}}$

$n > N$

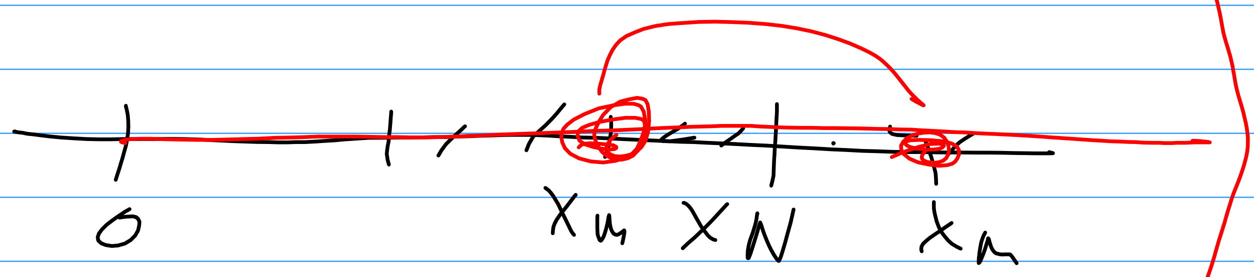
$$B(\underline{\underline{x_m}},\ M+1)$$

$$d(x_m, x_n) \le \underbrace{d(x_m, x_N)}_{\underline{\underline{M}}} + \underbrace{d(x_N, x_n)}_{\underline{\underline{M}}}$$

$(\underline{m}, n < \underline{\underline{N}})$

$(M \ge 1)$ $\qquad M+1 \le 2M$

$\to \boxed{2M}$



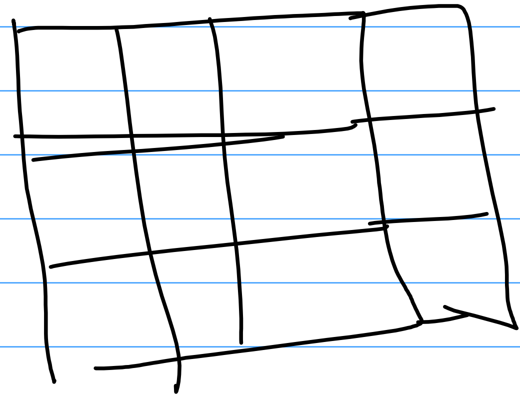
$\varepsilon > 0 \quad \exists$

Look on:

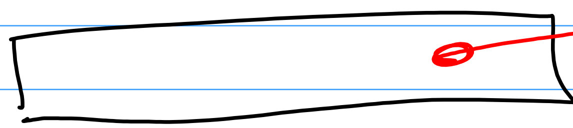
mathonline.wikidot.com

very nice site, see:

Functional Analysis



Search Math Online:



boundedness Cauchy sequence

you get a nice proof!

(When I studied, we couldn't do that!)

/the-boundedness-of-cauchy-sequences-in-metric-spaces

($M \geq 1$) The bound $2M$, I find better then the bound $M+1$ (from website)