## CONTINUITATER FUNCTILLOR!

LINCTA FUNCTILOR

(X, d.); (X, dz), b ⊆ X, g: b → Y, a ∈ b', pund de ocumbre

le Y, l= lim gunetin in pot a "daca V. V ∈ Vz (ôn Y)

3 Ve be (im X) a.t. 1((U) \ a a 3) n 8) = V

 $\forall x \in U \cap D \Rightarrow x \neq a, \Rightarrow f(x) \in V$ 

 $\lim_{x\to a} \S(x) = \emptyset$ 

7 Caracterizarea moturmii de limità

 $(X, d_1)_3 (Y, d_2)$  spati metrice =>  $\int \Delta = X \rightarrow X$ ,  $Q \in \Delta'$ .

Azirmatii echinalente:

lim fix) = l'def. vecimotali.

+ By (l, E) 3 Bx (a, 8.), f ((Bx (a, 8) nb)) \ 303) = By + E> = 3 & a.2. + x + a, d. (x, a) < 8 = ? => dx (g(x), 2) < E dy on Esp. S

N X x x b. 3 x m ≠ a , x m → a => g(xm) → l. dy cu service

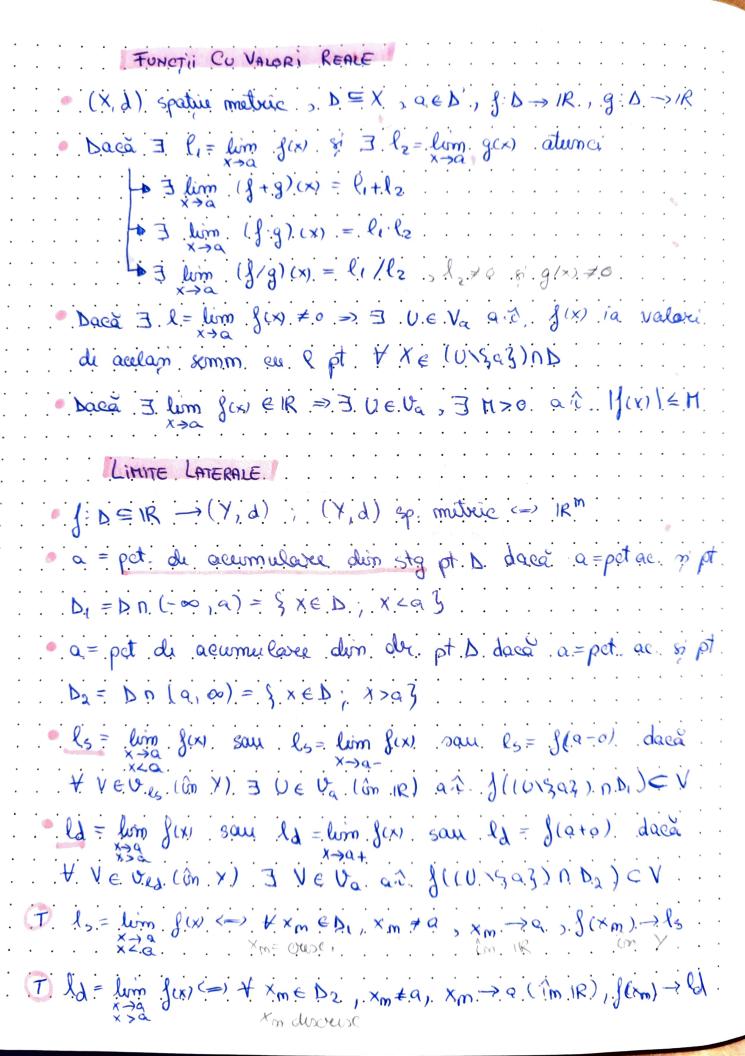
D'micitatea Cimitei

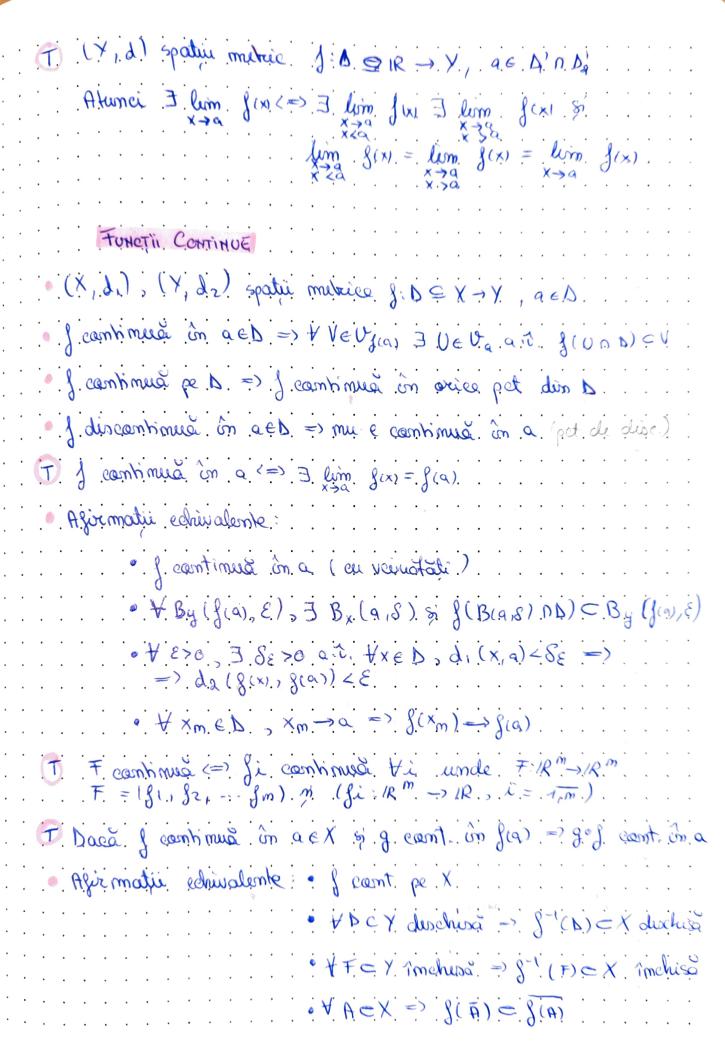
Dava 3 lim g(x) => limità e unica

ex: Id gasea limita. [ 1/1/203 - 12 , f(x) = sim + 1/203 - 1/2013

T Prim cipul sulestitutie

 $A \subset X$ ,  $B \subset Y$ ,  $J:B \setminus S \times_{S} Y_{S} Y_{S} \to Z$ ,  $g:A \to B$ Daca  $\exists \lim_{X \to X_{S}} g(x) = Y_{S}$ ,  $m \ni \lim_{X \to Y_{S}} f(y) = \ell \Rightarrow \exists \lim_{X \to X_{S}} f(g(x)) = \ell$ 





CONTINUITATED FOT CU VOLORI REALE
(X, d) opatie metric. > g: X → 1R
$f,g,:X\to IR$ ; $A\in IR$ , $M_J=\int_{-\infty}^\infty x\in X\setminus \int_{-\infty}^\infty g$ combinue $f\in g$
1+9: 1-9: 1.9.; d.J. => combinue pe X
. 1/g. combinué pe X/Mg.
181 san 191 compinue
Janso san garzo => 3 veva a à fixiso san fixizo treva
CONTINUITATE LATERALA
J. D = IR → IR, a ∈ D n D' pet acumu lave
J. comhimua r la stg => 3 lim f(x) = f(a)
Daca lim $f(x) = \lim_{x \to a} f(x) = f(a) \iff f \text{ combinue in a}$
"a" pot discombinentate de speta I:  "I mu e count lin, a"  " I lum foxx EIR. 8/2 lum foxx EIR  X39
· 3 lum f(x). ∈ IR. 8/2 lum f(x) ∈ IR
" pet discombinuitale de speta a II-a:  " 3 mu e comt ûn " a"  " a" mu e de speta I
DISCONTI MUITATILE FUNCTIILOR MONOTONE!
$1: 1 =  R  \rightarrow  R $ = interwal

 $\int consc / str. consc => \forall x_1, x_2 \in I ; x_1 \in x_2 => S(x_1) \leq f(x_2)$ 

I discusse / str. discusse => $\forall x_1 x_2 \in (x_1 \times x_2 \Rightarrow f(x_2)) \ge f(x_2)$ .
1 manotana => ouse/ str vuse/alisouse/ph. discuse.
T != interval duschies , g eure => toate dire lui g sunt de peter.
T! ! = imterval , g mometains => mult. tuturer dix lui g e al mult
mum aralula.
O. PERATORI LIMIARI SI CONTINUI
operator/oplication limitated: T: /R m > 1Rm (x+y) = T(x+T(y).
. L(1R <sup>m</sup> , 1R <sup>m</sup> ) = 3, T:1R <sup>m</sup> → 1R <sup>m</sup> , T. limiara 3
T: IRM -> IRM limitated => T. big (=> T(x) = 0 => x = 0
T: 1km -> 1km limi avec so bij => izomar fism limi ave.
Bata camemica: $xeiR^{m}$ , $x = (x_1, x_2)$ , $x_m)$ , $x_i \in iR$ , $x = 1, m$ $e_i = (o_1,, o_1, o_2,, o_n)$ $f_i = (o_1,, o_n, o_n)$ $f_i = (o_1,, o_n, o_n, o_n)$ $f_i = (o_1,, o_n, o_n, o_n, o_n, o_n, o_n, o_n, o_n$
$T(x) = T(x_1e_1 + \dots + x_m e_m) = x_1 T(e_1) + \dots = \sum_{k=1}^m x_k T(e_k).$
Malvicea et asată operdorului $l: H_7 = (a_{jk}) \subseteq M_{m,m}(IK)$ . $j = l_1 m_1 k = l_2 l_2 k = l_3 l_2 l_3 l_4 l_5 = l_3 l_4 l_6 l_5 l_5 l_6 l_6 l_5 l_6 l_6 l_6 l_6 l_6 l_6 l_6 l_6 l_6 l_6$
Malsicea at a sat à operdorului $T: A_T = (a_{jk}) \subseteq M_{m_1m_1}(1R)$ $J = I_1m_1, k = I_{1m_1}(1R)$ $J = I_1m_1, k = I_{1m_1}(1R)$ $M_{m_1m_1}(1R)$ $M_{m_1m_1}(1R)$
TIRM -> IRM , SIRM-> IRP Windows => SOTIRM-> IRP Line > Asor = As Ar
T T bij <>> At inversabile.
T limiosea => T continua