

2+1+1+1-0

using root test in \{ \frac{1}{2^{2}} \frac{1}{3^{2}}

d= lin (14+ 134) - le

010

1= lim (31+21) 2 9-20 (62)

d 2 lin (34+25) 1/2
1-100 6

A = 1 lin [3h (1+ (2) 5)]/h

22 1 (1+(2))/2 6 4-10 [1+(2)]/2

as 2 - 30 (23) 2 - 30 and 1 + (2) - 1 80 series (-31) 3 - 30

as a 2 de series converges

classmate this 6 Using Root test: d= lim

2/4

d<1, , 5 9, converges "

The series Using ration fost ? Since of C1 the genics converges. Aleno, The series converges.

Criver! BA metric space (x,d) To Prove ? D x and & are closed seb-1 Arbitary intersection of closed sets and 3) Finite unrong closed sets in closed A set A is closed set if $A^{C} = X/EAX$ is an opened. Proof > 1 pc=x for the metric space (x,d) Show of has no element to open beels around

17 in not defined.

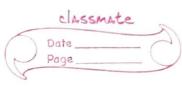
12 implies K is an open set.

This implies K is an open set. Since of has no etement, I none on of In which open ball exists. So of is openset. E. Xis as closed set. Also Ung X 3 B(n, R) CX son-home x is open -i- d i's as closed set.

your is A, , A, A, Be closed set. To Promis A, MAZMAZ... be closed ses. broof: A. A. A. A. are opn sets. She A, C, Dz', Azi, au oper seh nu following

Coly have

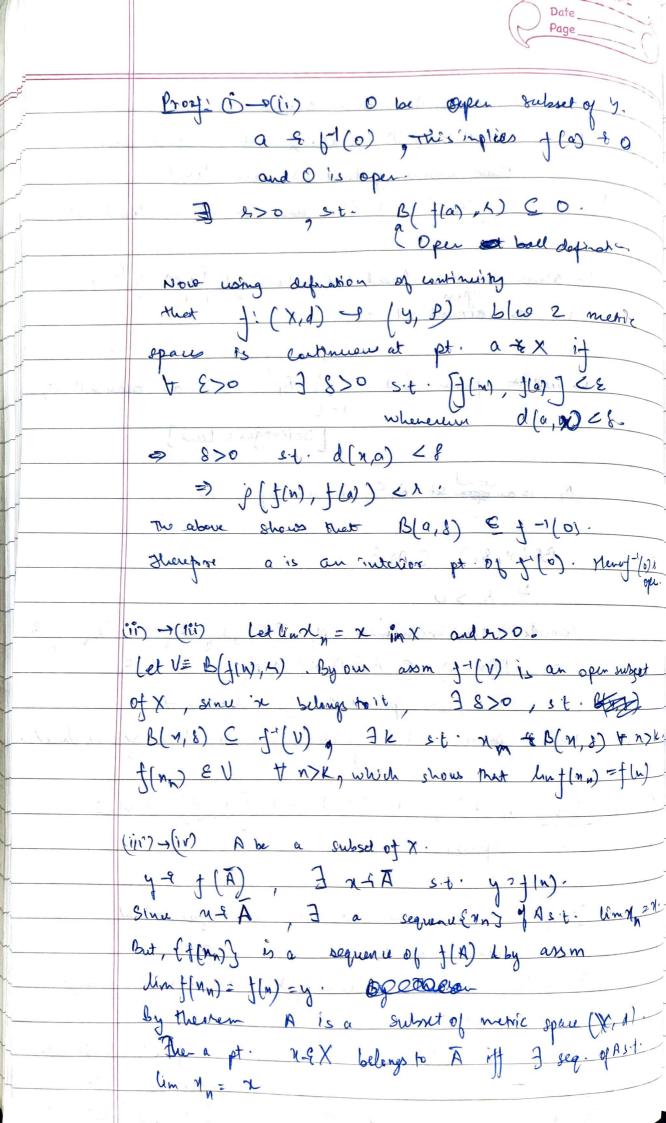
Coly have B, (M, 2,) CA, C b2 (N2, N2) € A2C B3 (N3, 13) € A3 C Union all of these sels. B, (N, A) U Br(M29 A) --- & CA, CUA2 UA36 we can white this as B(N,t) B(M,A) C(A, MAZ MAZ.) Co so set A, MAZ MAZ. Mence, Provid'



Burni Andr Agendard set. A, UA, UA, are closed sub. Finite unions of closed sell are clased. For A UA; and or is a closed set an expensed set we need to prove that \(\begin{picture}(1) \\ \alpha \\ \\ \ext{is an open set} \\ \ext{is 21} \ext{} \] [DeMorgai's law] A; is an open set A; C is an open set SI(M, Si) CAIC Consider The mingmen of & h, , & 2, &3 - 1 = 2 80 B(N, A) CA, CDA2 AAC. Anc Hence, we proved the () statement. Hene, proved hot finite union of closed sets is closed. Criven: A Jn , J: (x,d) -> (y,f) b/me 2 metric spaus: To know? (Bollowing statements are equivalent. 1) f is common on X. (2) f'(0) is an open subset of to when ever O i's an open 1) If link - n holds in & then \$ (Mm) = f (N) holds in Y.

4) f(A) = f(A) holds for every subset A of x.

(5) file) reclosed subset of x whenever C is closed subset of y,



from above theeren we can conclude that: y & F(A) that is $f(A) \subseteq f(A)$

(iv) -1 (v) Let C be a closel subset of Y. C= T holds in Y as it is a closed bet. Applying assumption above to set A= f1(c), we get $f(A) \subseteq f(A) \subseteq C = C$ ~ A C +-1(c) = A. Since, ACA is always True, it follows A? This shows that A of (c) is a closed subsectory. (v) = (1) a&x 4 &>0. Consider Clared set: C= (B(fla), E)) = & y 4 Y : P(fla), y)) bet for (c) is closed subset of X. $a \neq f'(c)$, $\exists 8>0$ $s+\cdot b(a,8) \subseteq [f'(c)]^{c}$ if d (Ma) CS; then P(f(n), fla)) < 2 holds so fir continuous at a. Since a is arbitary, f is continuous at X.