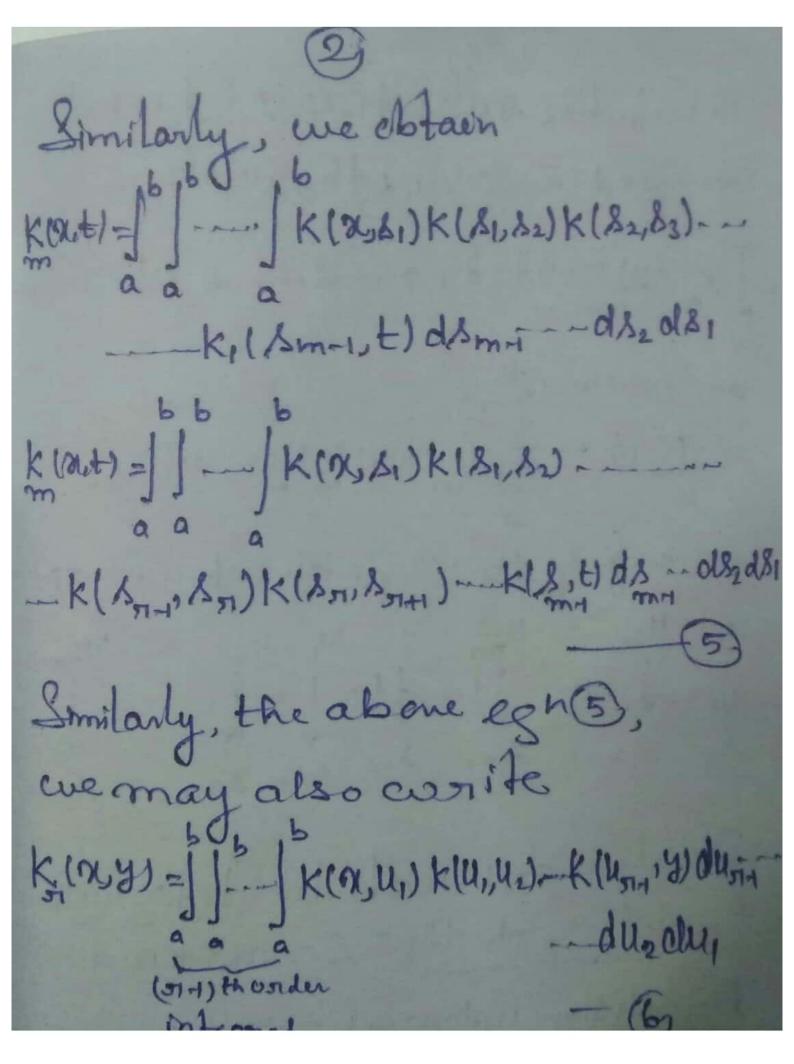
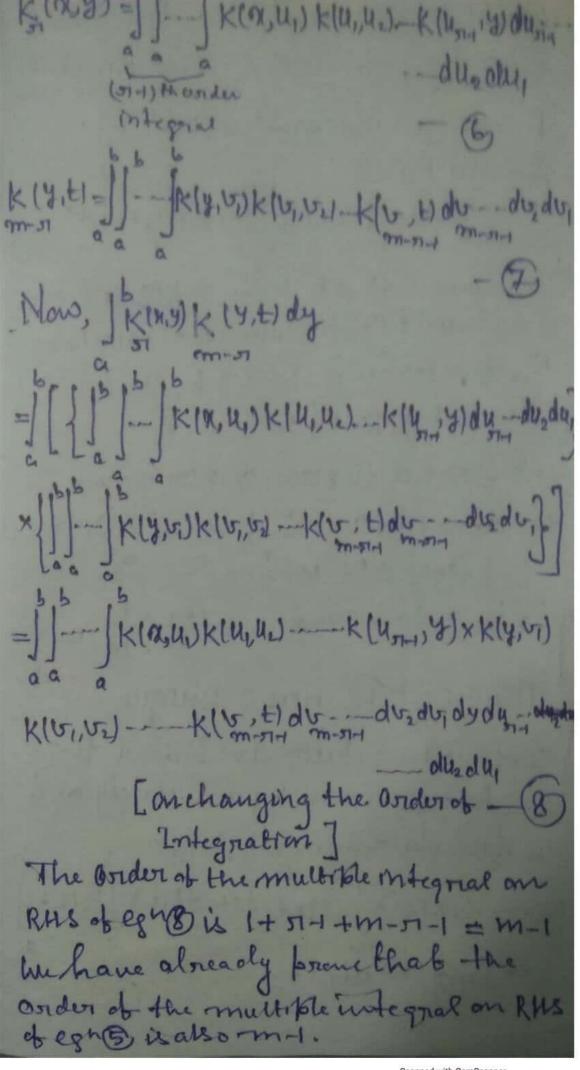


The mth iterated kernel Km (Mb) Sabrafres the rulabran Kom (Not) = K (Ny) k (yot) dy where of is any positive integer less than m. Broof: Let KING = KIN, b) then iterated kernel Kam (x.t) is defined as Kom(alt) = K(2,8) k (3,+) ds, m=2,3. Reworlding abone egus K(x,t)= K(x,8,1K (8, t)db, - + m - 1 in la

K(x,t)= K(x,8,1)K (8, t)db, (x,t)= K(x,s)K (8,t) ds = | K(x, 82) k (82, t) ds2 K(S,t)= K(S, S2) K (S2, t) dS2 using egn (a), then egn (3) meduces to K(2,5)= | K(2,5) [| K(3,5) K(3,5) disjoint m-2 = J J K (2,81) K (81,82) K (82, t) d82d81



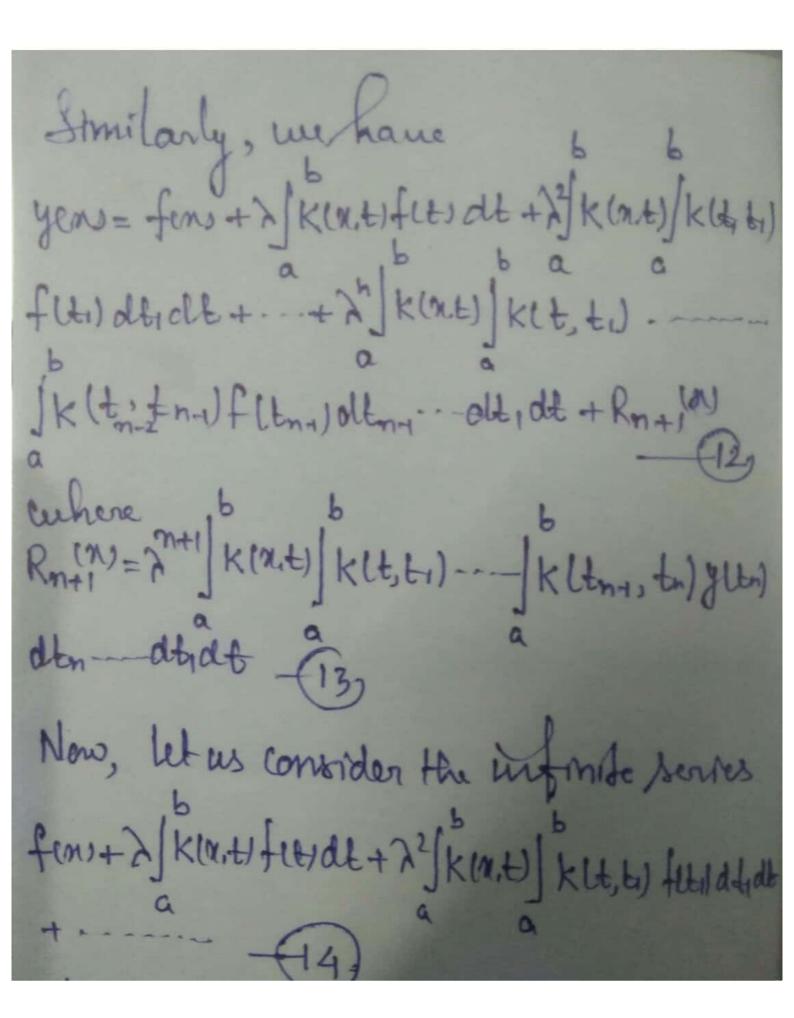


Therefore, multiple integrals involved in K (x, t) and K(xx)K(y,t)dy are both of the same onder, consith. Kiniti= Kiniy) Klyiti dy changing the variables of integration באת באת באת בא בתב בת Solution of Friedholm Integral Equation of the second kind:-Fredholm integral egh of the Second Kind yens = fins+ > Kinstry widt USuppose that Kornel

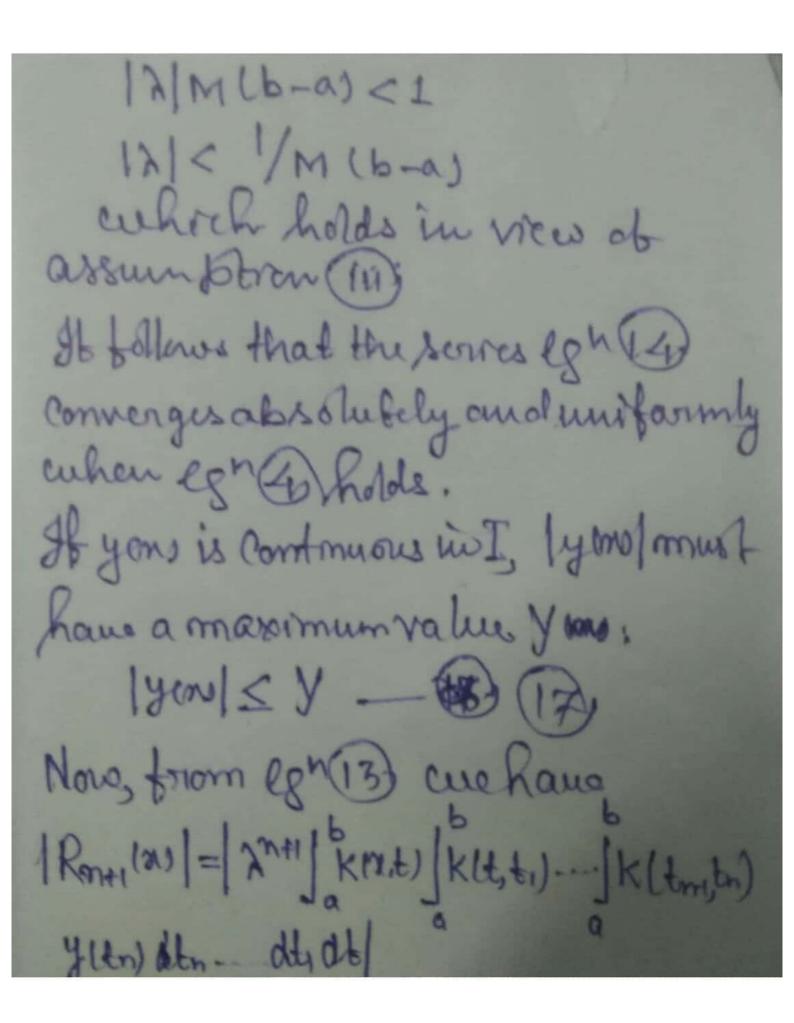
Fredholm integral egh of the second kind yens = fins+) Kinstiy (t) dt is Suppose that Kernel Kinit) \$ 0 is real and continuous in the rectangle R, forwhich asxsb, astsb also let | Kixitil & M, ino R the mining interval I, for which asks I femal < N, in I This a constant 1. E. [] < milba Then eg ho has a unique Continuous Solution in I and the Solutron is given by absolutely and uniformly convergent serves b year = fran+) Kmitifetidt+ 2 Kmit Klt,ti) f (ti) dtidt +.

Mow, su-writing eg 40 years = fins + 2) Klastiye Replacing a by t in abone long, we get y(t)=f(t)+1 (K(t,t))y(t))dt, Substituting the value of ye egnD, we obtain year = fins + 2 K(xxt) fet) + 2 K(tot) y (4) year=ferr + 2 Kint fet) dt + 2 Kint Kit t Re-writing eg n De cue have yet)=fet)+> | K(t, t2) y (t2) d

eg MD one yet)=fet)+n/K(tote) their wege (tr)=f(tr)+2 Klt1ste)yttesolle butting the above value of yetis in equ (8), cue get con=fon+ 2 Kint) fitide + 2 Kint) - Uti) + à Kitutely ltri dte dtidt yetz) died ti dt



for + 2 Kin, +) fetide + 22 Kin, +) kit, ti) fetilded In view of the arsumptions (is & (1) each term of the series le (14) is Continuous in I. It follows that the Series egy 14 is also Continuous in I, then it comerges with somy let VnIN be the general term of Serves egn (14), Vnow= 2 Kont Kutiti) --- Kltme tou flori) dtn-i-atiott_ From legh (15), we have Vnow = 2 Klant Klenty - Klent | Vmini = | x | NM" (b-a), byegh @ & 3 The Serves of which is a general bern Converges only enh



acommence on [111] It follows that the serves egh (4) converges absolutely and uniformly when egn (holds If your is continuous in I /your must have a maximum value y mos. 14 m/ 5 y - (12) Now, from egn(13) cue have | Ran+1(21) = 2n+1 | Krat) | K(t, t) --- | K(tm, bn) year) den - dy de : | Roman couls | X may y M Chas math using Ren 2 L (7) : egn & holds, -then Im Rn+1 (N) =0 It follows that the function your satisfying egn(12) is the Continuous function generally the Series Colly Solution of Volterra integral · Equation of the second kind

This let Rin, t. 2) be the nesswent Kennel of a Fredholm Megnal egn y cono=fino+2] kindiyitide, the the resolvent kernel Satisfres the integral egn Ren. t, 2) = Ken. t) +2 | Ken. 2/ R(2, 1, 2)d Insoft. We know that the rusolvent kennel à giran by R(a, t, 21 = 5 2 Km(n, t) ut Kilniti = Kimiti - 9 and k (1,+)= | k(1,z) k (z,+) dz Now, from eg 10, we

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1755+1. We know that vent kennel is given by R(a, t, 21 = 5 2 mod Km(n, t) Let Kilait) = Kimiti. and k (n,t) = | k(n,z) k (z,t) dz Now, from eg D, we have R(a,t, 1)= K, (n,t) + 5 7 K (n,t) = KINN+ = 2 m-1 b m=2 KINN+ = 2 m-1 b m=2 KINN+ = 2 m-1 b m=2 mes a winger putting motor in above Remit, 2) = KM, +1+ = 2 / KM, Z) K(Z, + RIALE, N = KINH+ = 2 2 1/2/K

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RMit,2)=KMit+> = KMit)+ > = KMit, t) KMit, t) dz = Kind) + 2 | Riz, t, 21 kin, z) dz Therefore, the regulare of SAh R(n,t,) = K(m, t) + 2 1 K(n,2) R(2,4) 1 sry to your self

RIM, E, AI = KIM, H+ X J K(M, Z) RIZ, 4 A) dz Try to your Self The Series for the resolvent Kennel Rlait, 21 Riait, 2) = 5 2 mil Komit is absolutely and uniformly Convergent for all values of & and t in the circle 71<87

& Find the Herafed Kennels 051- functions for the following Konnels (Fredholm Indegnalegy) (i) KMit = 12+8nt, Q=- T & b= X (ii) kmits = excost, a=0. & b=x 86) h - Griven that KIMI+) = 1x+8x+ Let K, (mit)= kimit and -Km (mit)= 1 K(1,2)k (z,t) dz @ putting m=2 in above egt cue Thrain Ke conit) = JK (Myz) | s(z+t) oz = 1 (2+8mz) (2+8mt) dz

Kn (mit) = | K(1, Z)k (z, t) dz @ putting m=2 in above es cue otherain Ke (mit)= | K(myz) | K(zit) dz =] (a+8mz) (Z+8mt) dz = n 1 Zdz + Bont | Sinzdz + n Sint da + 12 Smzdz Ko (mit) = 27 on 8mt + 27 Kg(mt) = 2x (1+2x8mt) Next, butting n=3 inche KIMIH= JKIAIZ) KIZ, HIdz = (a+8nz) 2x (1+ z8nt) dz

Kz(Met) = 27 | " (0+ 0128m+ + 8inz+ - Z 8mz sm+) dz = 482+482 Sm 6 K2(MA) = 4x2 (M+8int) Kalmet) = 4x2K, (met) Nows pulling m=4, we have **** K(n,t) = | K(m,z) K_2(z,t) dz Kylnet)= / (9+8+2) 472 (z+Snt) dz Kalmet1 = 472 Kg (2,t) Smotorly, we have K=(n,t)= 472 K3(M,t)=1674K,191+

Kylmit)= 1 (9+8+2) 472 (2+Snt) dz Kalmet1 = 472 Kg (2,t) Smotarly, we have K=(n,t)= 472 Kg/M, += 16x4K, MH Kalnitl= 4x2Kalnitl=16x4Kalnitl Thenfore the neplessed iterated Kennels Knint as follows if n=2m-1, then K (nit) = (2x) 2m-2 (x+8nt) anc1,2,3. if m=2m, then Kom 19, H= (2x) (1+0 bnH) m=1,2,3

(ii) Griven that kint = e 6001 Let kilmitt=kmitt=excost-10 and Kimit = J Km, z) k (z, t) dz putting n=2, in above egno, we obtain Kemit = 1 Km, 2) K, 12, Hde = 1 e2 cosz z e cost dz = e " Gst / ez coszdz = e Cost 10 (Cosz+8nz) = e costa [-(1)e - 72] K21Mill= (-1) (1+ex) excost Next, more butting mas

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K21mitt= (-1) (1+ex) except Next, month putting m=3, two cabone egn D, me get Kglmdy = JKlm, ZJK2(Z, H) de = Je^cosz {- 11+1 } ezcost de = - (1+en) en cost je coszdz = (1)2 (1xen)2 ex cost (4) and Som,

we get, the Herated kernely K (mot) = (-1) mid (1+2) en cost m=1,2,3-Try to yourself Fing the Herated Kornels as functions for the following Kernels (FIE) (i) k (net) = Sin(2-2+), 052625 (1) KIMH= n-t, a=0, b=1 Defermine the resolvent Kennels for the FIE having kernels (i) Kinuts= ex 26 a = 0 & b=1 (1)3 K(mit) = CHANO(1-4): acH. Rb21