( Du = 0 3 for 9 52 ) L. 18=2 = (Dim x) (D) U-1 - (8)"U Using the separation method We know that w= re(p, x); Fourier is idea states that we can rewrite er as a product of 2 function; so: u(g, x) = U(g). V(x). Non we plug this in our equation (taplace equation): 392 u + 8 2 w = 0 in Soo, we will get U"(8):V(2) + U(8):V"(2)=0 / iv U"(3) = + V"(x) Since this is an U(9) equality of functions N(A) they need to be f(8) > > > > (x) a idén Toups. constant /  $f(g)=g(\alpha)=\chi$ 

Nous We have 2 equations that only depend on fand &. U"(8) = 1 and V"(d) = 1 U"(9)= x.-u(9) and v"(x)= x.v(x) Having this and knowing that would u(e,2): and Du = 1. 2 (3 2 u) + 1 2 2 u (1) and that of Du=9:0002 = (2) moitous Cuix=2 = (Dim f) so rous We demate (1) as: ligg + 1 ug +1 By homausing all this and u(f, x) = = U(9)V(2)=) 0= Du=V"(9)V(2)+ + 1 0'(9) V(x) + 1 0(9) V'(x) (x)"V 320"+30"+XU=0 x=0(3) povo XV=0 world d N(x+21)=N(x)(x) 1=(2)0-(9)1

(1) V(d) = C, costT d+C2 sim (x d 6) V(d)=c, e=x d +c2 e=x d, mot good for (8) N(x)=(1x+c2, good andy 10c,=0  $\sim$ From (\*)=) 2T=b.2T => TX = kz=> => >= bo ; 4/2=1,2,3...=1/(x)=cicospart + C2 Dim Ad c-9/2 50/ (= 5= 2 (= 5= 9) 3°0" + 90' - 2°0 = 0 - Enler ego h = 0 = 2820" + 80' = 0. We substitute 0"with x-= , g2x + gx = 0 = ) x = - 1 Since U'= V= 1 U= lm g+c 0= 10 0= 10 0= 50 m=1,2,3 => U(8)= 3=> 5 a(a-1) 3+ g. or god - to 2g = 0 Dy reducing to common factor we get of the = 0 = > or = + h = > = > U(g) = c, gh + c2 g-h So for \=0= 0 = 0 = c1 \ Stc2 >= 12= ) wk = (c18+c28+c3coshat.

and since we know that our case is I 2, we get the general formula for 25 mr; rushere mr € N . 1700 2 2 + 5 (a, cos h d + b, Din had)

2 + m=1 (= 12 d = 14 (= (+) max Now knowing this lets value our exercise: Lu, 3=2= (sima) R = 21 = ) g = 21 = ) for u/g = 21 = = and + E an cas hat + bh sim har = (Dima) -X My O statistadus We identify the coef. a = 0; a = 0; b = sim x, b B + 1 = 0; en = (32 (sim x)2 (ak +1 = a; 8 17349/13 =0U -0= 1 50/ 00 24(000) (1-1-1-1) = AU (= d=1