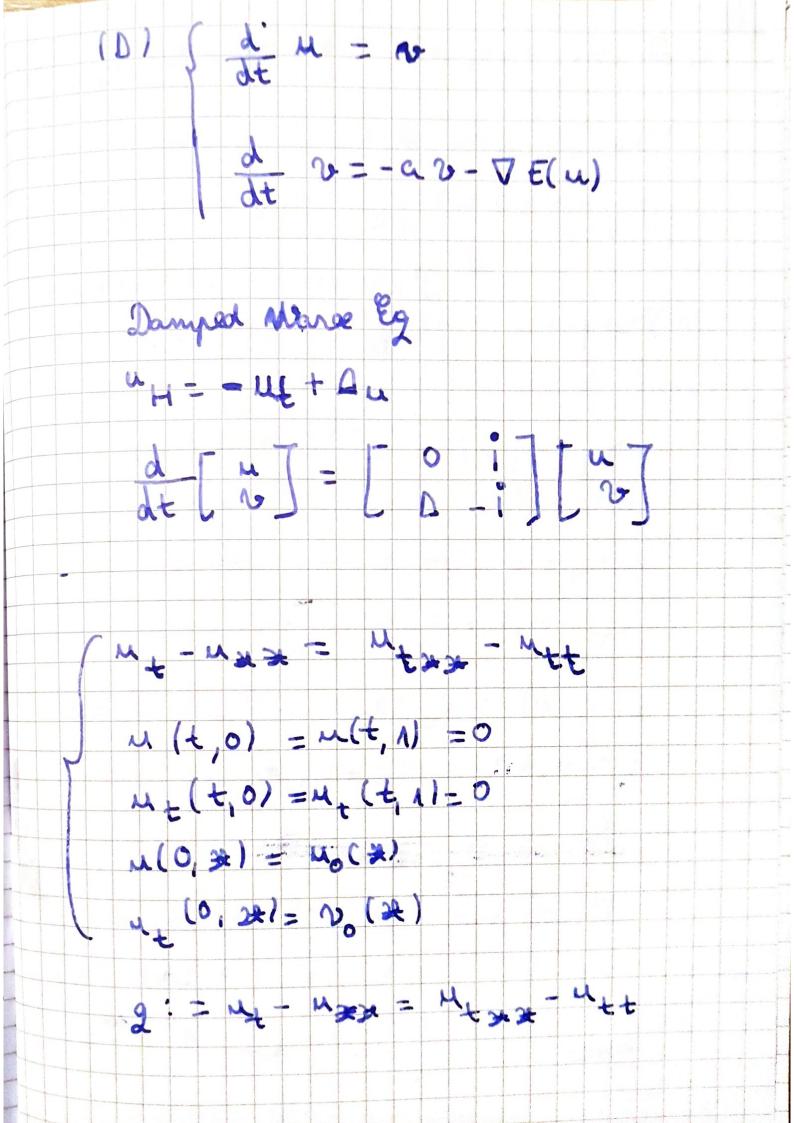
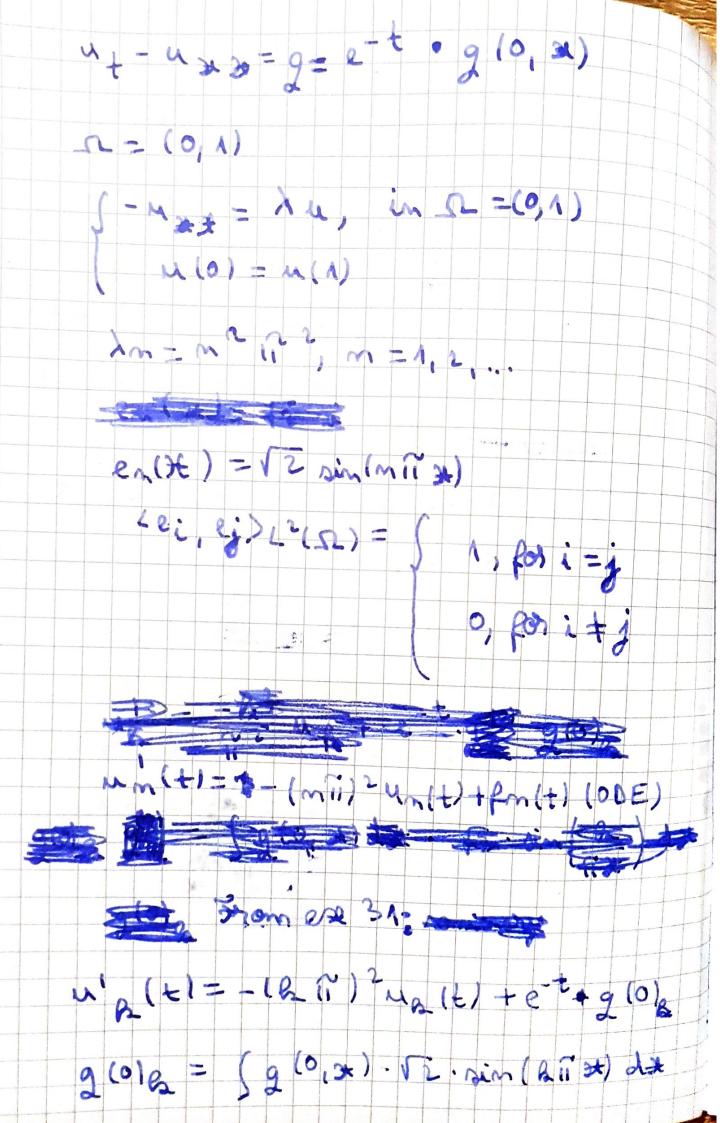
KOHAN ALEXANDAU Lowerson 33. A Damped Warse Eguation: true types of damping. Consider the mirred problem for the damped waree Equation with true types of damping utttut = - utxx = uxx, in(0,00)xa u(t,0)= u(t,1)=0, ut(+,0) = wt (+,1)-0 u(0,x)= uo(x) 4 (0, 21) = 10 (21) Girse a representation pormula for the Domped / Disipation Lystems a > 0 E strict Lyap d ( 12 11 20(4) 11 + E (ut)) = - alloct) Jein Emergy Totartial Energy



Denote g (t, 3t): = 11 + - 11 3 2 = 4 = 14 Then, observe that 2+9-0-)9+- m++-(m+)++ 2+2=0 9+1=0=19=-1 Frangeare 32 + 9 = 0 = ) = ) g(+, x) = e-to. c Mo(x) Therefore, we should solve 4-42x= 2 . c g(0, x) = M+ (0, x) - M3+ 3+ (0, x-) c= 20 (x)- Mxx (0, st) 2 (t, x)= e t.c notice that ( u(t, 0) = u(t, 1) =0 /~(0, 2=1= 4. (3=) (x) Wt-MAX = e-to-c THE D



m' = -a. u+ P(+) Froblem 1, Leminory 1 = > m(t) = e-atmot Ste-(t-T)p(T)dT UB (+)- 2 (2)112