17012022 -

New Section 1

Conversion of F. I. E. to B. V.P

Earl Convert the following F. I. E to BVP.

u(1)= 3x2+ (k(2,t) u(t) dt;) ((x,t)= (x(1-t); x(t))

 $u(x) = 3x^2 + \int t(1-x)u(t)dt + \int x(1-t)u(t)dt$

The derivative on both sides of (2) ω . s. to χ $du = u'(\alpha) = 6\chi + \int_{\partial x}^{\partial x} \{t(1-2)\} dt + 1, \chi(1-\chi)u(\alpha)$

+ Jon {2(1-4) }u(+) }dt-1.x(1-2)u(x)

 $u'(x) = 6x - \int t u(t) dt + \int (1-t) u(t) dt$

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Jaking derivative on both sides of (3), w, a, to a, $u''(a) = 6 - \frac{d}{dx} \int_{-\infty}^{\infty} t u(t) dt + \frac{d}{dx} \int_{-\infty}^{\infty} (1-t) u(t) dt$ + Son E (1-4) n(x) } dl-= 6 -] = {tu(t)/ut - 1, xu(a) -1(1-x)u(x)

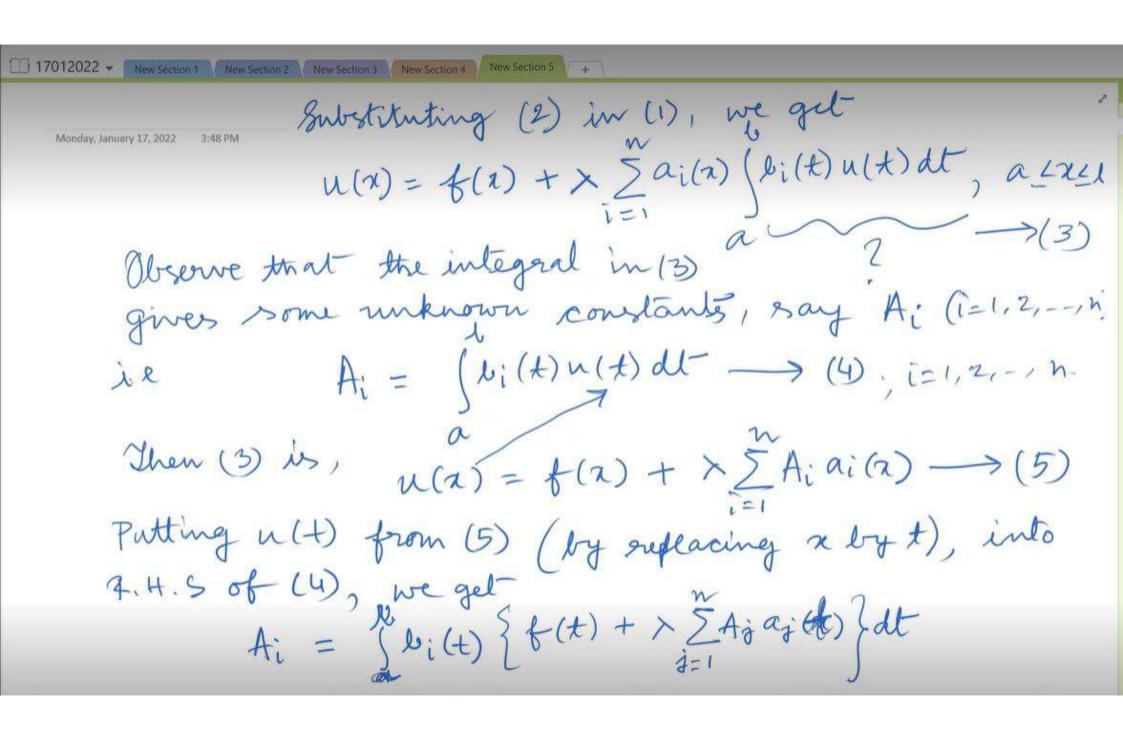
u''(x) = 6 - x u(x) - (1-x)u(x)=6-2y(2)-u(2)+2y(2)

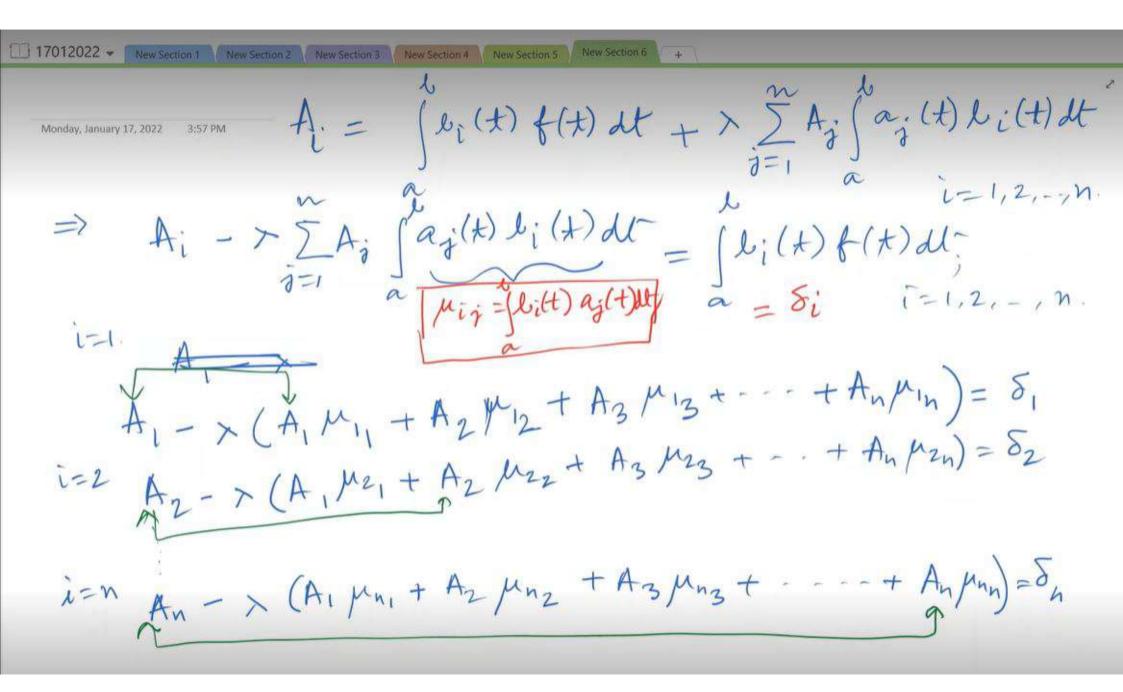
u"(2) + u(2) = 6, > required diff-lgm.

together with the boundary conditions, [U(0) =0, U(1)=3](5)
The given F.J. E is converted into a BV/P given by the DE
(3)4x b.c./s(5).

17012022 Wew Section 1 New Section 2 New Section 3 Convert the following f. I. E. to a BVP. $u(x) = e^{x} + 1 + \int K(x,t) u(t) dt, \quad K(x,t) = \begin{cases} 2t, 0 \le t, \\ 2t, 0 \le t, \end{cases}$ $u'(x) = e^{x} + \int f(x,t) dt = \int f(x,t$ Monday, January 17, 2022 $u'(x) = e^{x} - 2u(x) = u''(x) + 2u(x) = e^{x}$ Put n=0 in(0), $u(0)=e+1+\int +u(1)dt$ u'(1)=e. $u'(1)=e+\int 2u(1)dt$ = 2 o+ $\int 2\sqrt{0}$, u(4)dt u(0)+u'(0)=1 u'(1)=e.

New Section 1 New Section 2 New Section 3 Methods of finding solutions of Fredholm Integral Equations. A. Hethod of separable kernel. Definition: A kernel K(x,t) is said to be reparable or degenerate if it can be expressed as, $Y(x,t) = a_1(x)b_1(t) + a_2(x)b_2(t) + - - + a_h(x)b_h(t)$ det us consider some F. I. E of the form: u(a) = f(a) + > (k(a,t) u(t) dt -> (1) $K(x,t) = \sum_{i=1}^{n} a_i(x) b_i(t) \longrightarrow (2)$





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17012022 New Section 1 New Section 2 New Section 3 New Section 4 New Section 5 New Section 6 New Section 7 Bolving the materiac equation (6), get the nuknowns Ai's. Substitute there Ai's Monday, January 17, 2022 into (5) to get the solution u(a) to the given integral equation. Ex-1 $u(x) = 3x-2+ (x+t)u(x)dt \rightarrow (1)$ Kornel K(2, t) = 2+t => It is separable. スナキュース.1+ た.1 or, u(2)=32-2+2 Ju(+)dt+ J+n(+)dt-三四四十八十 +aza)/2(+) $A_1 = \int_0^1 (h(t)) dt - \int_0^1 (t) dt - \int_0^1 (t) dt$ a,(2)=2, b,(+)=1 az(a)=1, lzH=t.

New Section 1 New Section 2 New Section 3 New Section 4 New Section 5 New Section 6 New Section 7 New Section 8 New Section 9 By violate of (3) & (4), eq. (2) becomes, $u(2) = 32 - 2 + A_1 x + A_2 \rightarrow (5)$ Monday, January 17, 2022 $A_1 = \int_0^1 (1) dt = \int_0^1 (3t - 2) dt$ $A_2 = \int_0^1 t n(t) dt$ $A_1 = \int_0^1 (3t - 2) dt$ $A_2 = \int_0^1 t n(t) dt$ $= \int_{0}^{\delta} (3t - 2t A_{1}t + A_{2}) dt$ $= \int_{0}^{\delta} (3t - 2t A_{1}t + A_{2}) dt$ $= \int_{0}^{\delta} (3t - 2t A_{1}t + A_{2}) dt$ $= \int_{0}^{\delta} (3t - 2t A_{1}t + A_{2}) dt$ = 3 -2 + A1 + A2 Solving (6) V(7), $A_1=3$, $A_2=2$. Putting A_1 , A_2 into (5), V(x)=3x-2+3x+2=6xu(2)=62 1

17012022 Solve! y(2)=e+> (2e2ety(+)dt Monday, January 17, 2022 $y(a) = e^{x} + \sum_{i=1}^{\infty} e^{x} = \frac{e^{x}}{1 - \sum_{i=1}^{\infty} e^{x}} = \frac{e^{x}}{1 - \sum_{i=1}^{\infty} e^{x}}$ $\lambda \neq \frac{1}{\rho^2 - 1}$ y(2)= > [2e2 + y4)dl-