100	
	Lecture 3.
Exercises uto	LD roc
4.	Canider the equation Ly'+ Ry = E Sincox. where L, P, E, w
	are >0 Cartants.
	(9) Compute the colation of satisfying p(0) =0.
	(b) Show that this solution may be written in the form
	Q(x) = EWE O (RIL)x + E GIN for - x)
28 1	P+10262 1 1/2+1072
	where a is the angle satisfying as ar -
	(a) Compute the Colation of Catisfying $\phi(0) = 0$. (b) Show that this colation may be written in the form $\phi(x) = E\omega = \phi(RE)x$. Excention of the form $e^2 + \omega^2 E^2$ $e^2 + \omega^2 E^2$ $e^2 + \omega^2 E^2$ Where e^2 is the angle satisfying $e^2 + \omega^2 E^2$. Since $e^2 = \omega = \omega = 0$.
	VP+co2L
	(c) Sketch the graph of the solution given in (b).
	I was to be the state of the st
(6 in H) 5.	Let Q Catisfy y'+ay = b_(a) & Y satisfy y'+ay = b_(x).
	offere by and depred in the same troops I
Terrist	1. / Land 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	(b) Ajyly (a) to find the Solution of y'+y = Sinx+3 Gos 2x. Whose graph passes through the sign.
	whose graph fasses though the digin.
	160 11 100 100
binkk) 6.	Coulder the egn y't ay = 500 Were a is a contact sit
	Rea > 0 and 5 is cts. on 0 (x (to which tending & ext.
	Powe that every solution of this equ. Tenos to 15/9 as x ->
	Consider the egn y't ay = 50 where a is a Content sty Rea > 0 and 5 is cts. on 0 (x (so which tends to pla as x > 0. Prove that every counting this egin. tends to pla as x > 0.
	I I I make a late of the sale of a city in
	16(1)2 0 2 0 1
	118(1)8 9 / 2 118
	95 103 8 000 13 5 18 - 02 2
	92 10 9 8 8 8 100 10 10 10 10 10 10 10
	A mark of
	o-222 at 12 white on a govern
1	Constant of the second of the second

E The general linear equation of the first order. Canider y'+ assig = b(x). Where q, 5 are to fu. (anider y'+ abory = b(x). Where a, b are of fun.

on some interval I. If we are given an equation

of the many divide by a(x) to abtain an equation of the

contien form.

The lite where a(x) = 0, called fingular fils.

whe toablesome. This will be dealt with later.

We apply some anchood. Toy to find a for 4 5.1.

U(p+ap) = (up)

If A is for st A' = a, for ex. A(x) = sa(t) th.

alcreated then such a is to a

for u is given by u = et.

Since (e⁴p)' = e⁴p' + aep = e⁴(p'+ap). Merefre $\phi' + a\phi = b$ iff $(e^{A}\phi) = e^{A}b$. and this is valid iff $e^{A}\phi = B + C$. where c is a Cantant and B is a for whose definite $e^{A}b$. Can charse B: $B(x) = \int_{x} e^{+(t)} f(t) dt.$ So e^Aφ=B+C i/b φ(x) = P B(x) + cP Remork: 9:0-B is a particular Elm. (the case c=0)
and $Q = P^{-A}$ is a Solution of the hamogeneous
equation y'+ 961y=0.

Theren. Suppose 9, b are cts. f. on interval I. Let A'se a fn. st A'=9. Then the fn. Y: $\psi(x) = e \begin{cases} e & b(t) & dt \end{cases}$ where $y \in I$ is fixed, is a Solution of the equation y' + A(x)y = b(x) an I.

The fr. φ , (x) = e, is a Solution of the hangenous equation y' + A(x)y = 0.

If c is any (atant, $\varphi = \psi + c\varphi$, is a Solution and every Solution has this form. Remark: e1 = g can be integrated and shed so the idea to was to

try to make are side a desirative y saif function.

Keeping this in mind will allow you to find solutions. Example. g'+ (Cash) y' = Sixx Gox. Here a(x) = Cox, L(x) = Cinx ax, and a choice for

A is A(x) = finx. Thus i) p is any solution

(cand p) = cand anx coxx. and integration

gives

Emm p(x) = (Sinx-1) e +C. $dr \quad Q(x) = (Gn x - 1) + ee$