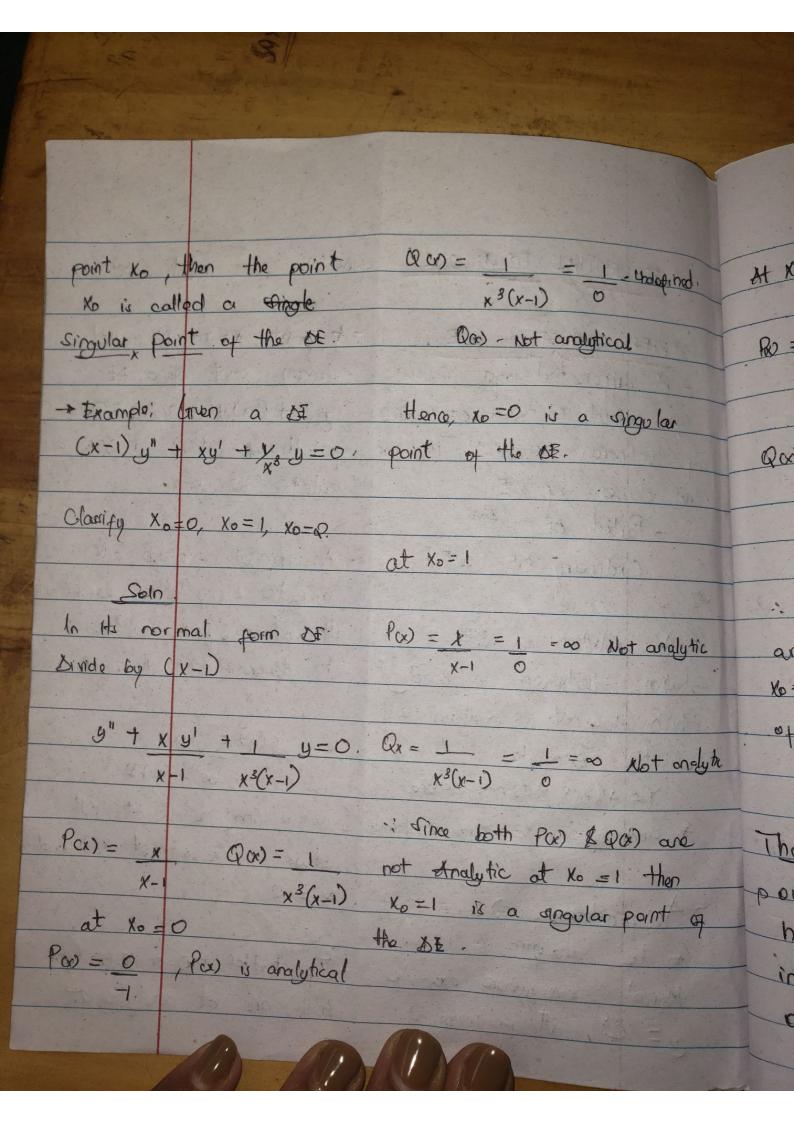
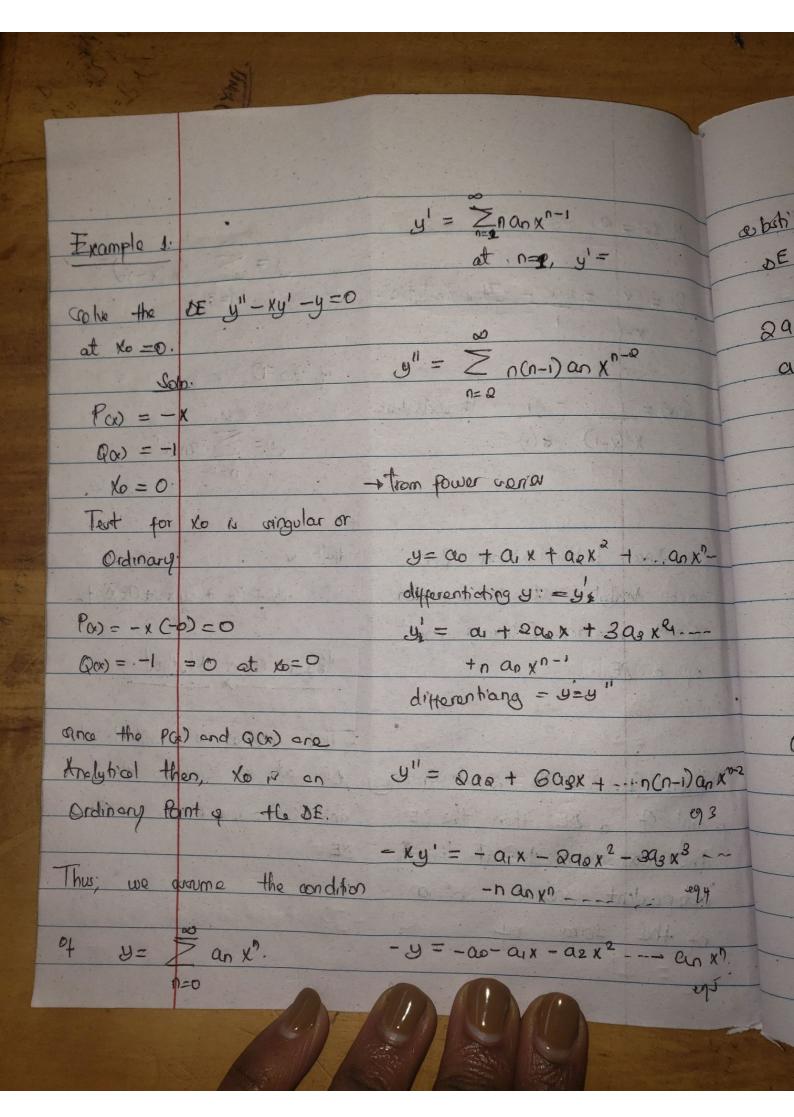
AMA

SIFFEREXITIAL EQUATIONS function are analytic function. JERIES SOLN OF A B.E. - A point X= x0 is called an - A differential egn is an ordinary point of a DE ego which contours derivatives y" + PCX)y' + QQy = 0 of unknown functions. There are if both the Pas and ace are two classes of SE
- Partial SE CP analytic at xo. - Ordinary DE CODE) - A ractional function is analytic every where exapt out - A polition of DE is a all values of x where relation between x and y the denominator is zero which downot contain any dorivaties example eg fra) = a Y= A Cosx + Bsin x where x2-8x+8. A and & are orbitary constant. f (a) is Analytic at all bno (=x tapxa x po voular - A tunction pass in sound x = Q. to be analytic if it is obegined everywhere example $y = e^{x}$, all polynomial - It either Pas or QGS (or both) are not analytic at



MAN $y = \sum_{n=0}^{\infty} \alpha_n (x - x)^n.$ if X0=0 $y = \sum_{n=0}^{\infty} a_n x^n$: aina both Pox) and Q ox) y= 00 + aix + 92x + --. are malpho at xo=2 then 16=2 is an Ordinary point Power varior Method. of a DE. -This Mothed is used to volve DE at to where to is Theorem 1. If to it an Ordinary and Ordinary point of the point of a DE, then the DE DE how two non trivial linearly independent meries ablution of the form of



abotitite eq 3, 4 &5 10 the DE, 200 + 6 a3 x + --- n (n-1) an x -2 - a1x - 2a2x -3a3x3 - nanxao - a, x - ao x 2 - an x = 0 Coefficient of x4. - a1x - a1x = 0 x (-a1-a1) =0 starting with constants. - 200x2 - 96x2 = 0 $\frac{1}{\sqrt{2}} = 0$ $\frac{1}{\sqrt{2}} = 0$ QQa - Qo = 0. 200 = ao as = /2 as -- * + take; n (n-1) an x n-2 - nanx - anx n=0 coefficient of K' Make power of x the same 2 X D let n-o = k in the fit term 6 a3 x - a1x =0. and let n = K in the end and 6 asx = 2a, x and term. a3 = 2a1 in=k+& and n=k as = 1/a1 - - .. * *

n(n-1)) an X K+2
- (K+8)	(K+1) a xk - K dk xk - qk xk =0.
27 4 18 17 2 34	SON - "XXXXX-XXX - XXXXXXXXXXXXXXXXXXXXXXX
	O= CANAL TROP AND
(K+2) (k+1) a - ax (k+1) =0
	Car July and Land
	Make arts the subject.
	The state of the s
17,50	QK+0 - QK (K+1) (K+0) (K+1)
	(K+8) (K+1)
	$ a_{k+2} = a_k = 0$
9="110= "y/s	$Q_{K+Q} = Q_{K}$ = Recommence Relation for $K=0,1R,3$.
LAI	5,17,3
When I	$K=3, Q_{5}=Q_{8}$
making of the	$Q_{2} = Q_{0}$ $Q_{3} = Q_{3}$
K	$=1, a_3 = a_1$ $k=4, a_6 = a_7$
	3
k=	2, Q4 = Q0
	4
	The state of the s

Now our arranged only y= ao + a,x + ao x2 + azx3+ axx4 + axxs + aaxc+. y = a + a x + a x x + a x x + a x 3 + a x 3 + a x x + U= 00 [1+1 x2+1 x++ 1 x2] + 0, [x+1x3+1x3+...] Graneral Sch: ycx) = Ay, + Byz. UN) = A[1+1x2+x++1x6+-]+B[x+1x3+1x3+-]
3 15 where A and B gro arbitany constants.

n(n-1) an x n-2 + nan x n+2 + an x n=0 U-5=K U=K-1 U=K. F39 60 5 F 19 10 55 - (K+2)(K+1) 9 XK + (K-1)9 KK + 9KK=0. Make april the subject ak+0 = - (K-1) ak-1 - ak xk (K+2) (K+1) Test who show it do laws from K=1 Also: For a gn. like; (x-1)y" + (1-x)y 1-y =0. - 1st right in the normal form to tast Pas & ara) then open brakeli ally property and a finally conden xy" -y" +y! -xy' - y =0 + In its normal form. an W. y Z ao + a,x + 92x2 + 93x3 ---

Excercice,

1. Show that the soln of the DE y'' + y = 0 at $k_0 = 0$ is $y = A \cos x + B \cos x$.

- a. Write the following of at x0=0

 a. Write the following of at x0=0

 by " + &xy = 0.
 - b) y" +xy+y =0
 - c) (x2-1)y"+ 4x9+8y=0
 - d) (1+x2)y"- xy1+qy=0.