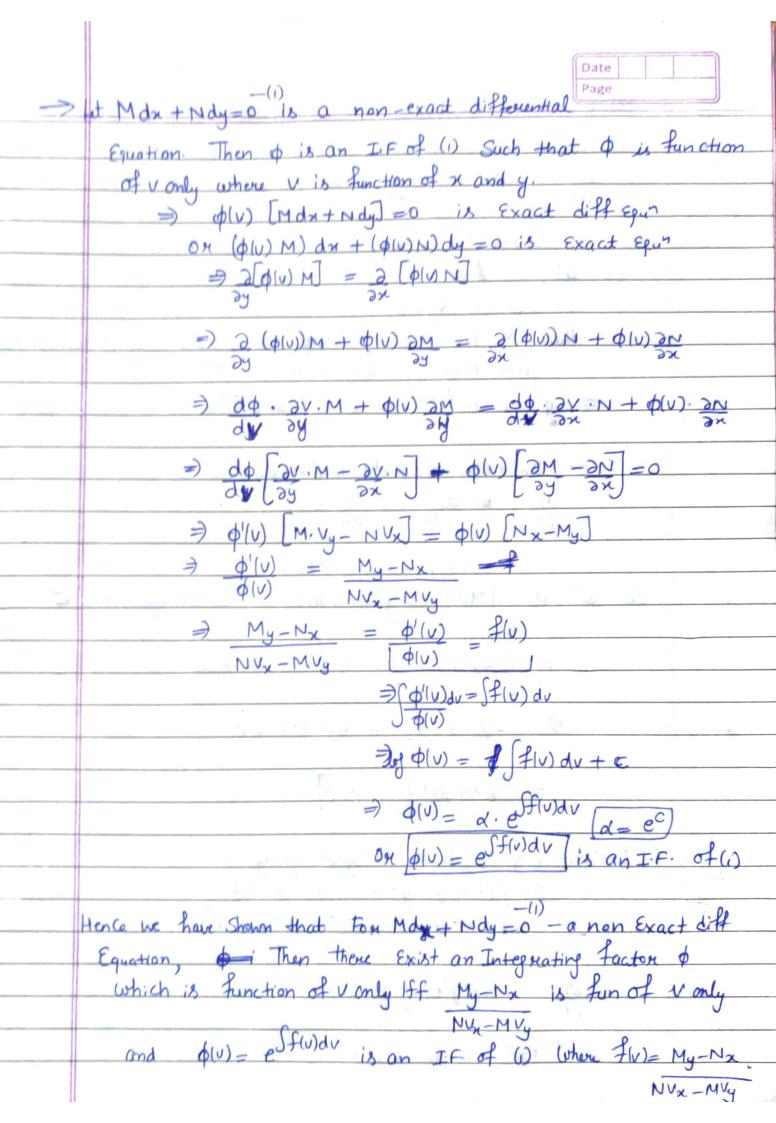
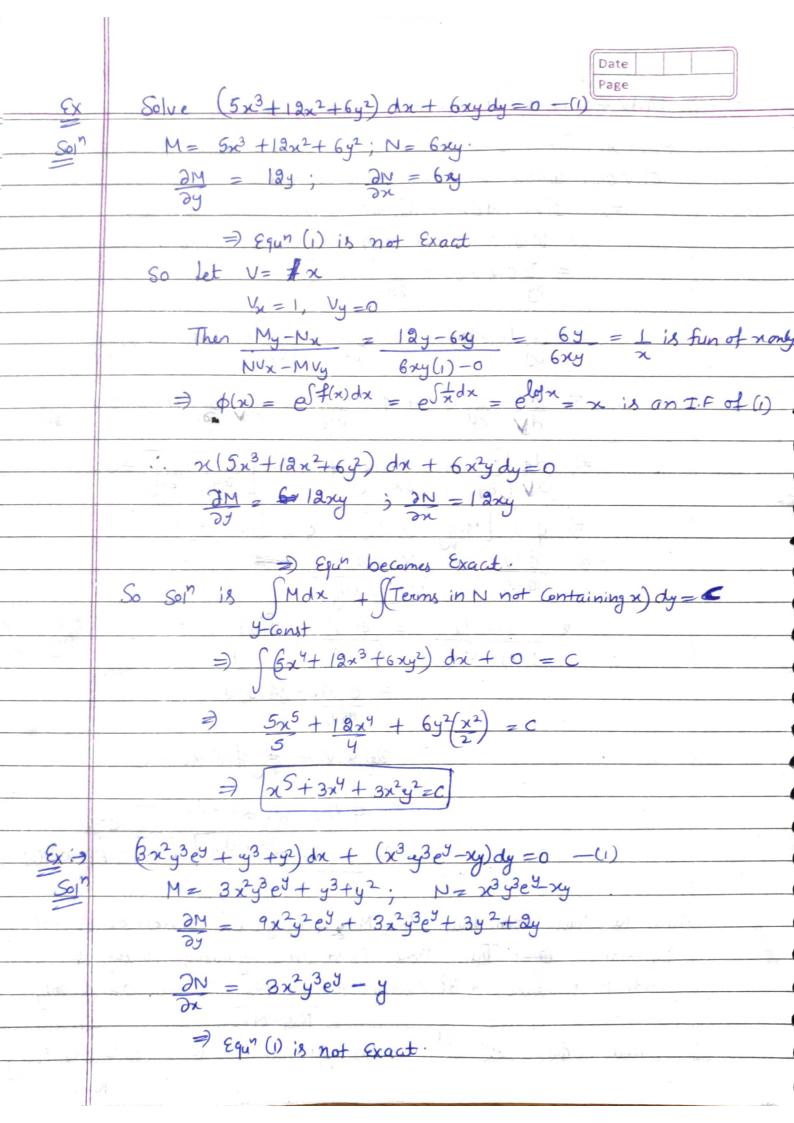
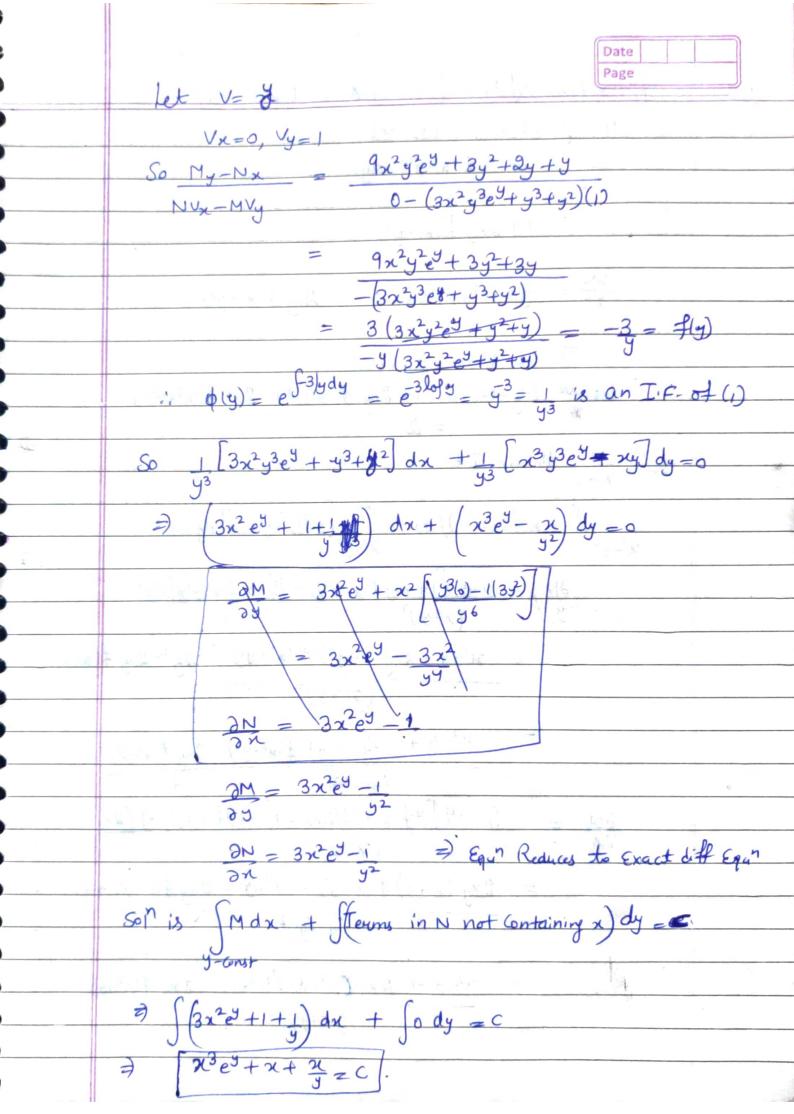
	Page
	Integrating factoring
	If $M(x,y)dx + N(x,y)dy = 0$ is a non-exact equation
	then sometimes Equ" (1) can be made exact by multiplying
	it with some function $\phi(x,y)$. This $\phi(x,y)$ is called an
	Integrating factor (I.F.).
	i.e. If M(x,y) dx + N(x,y) dy = 0 is non-exact
	and If we multiply it with \$(a,y) s.t.
	$\phi(x,y) M(x,y) dx + \phi(x,y) N(x,y) dy = 0$
	is an exact diff Equir Then p(x,y) is called an
	Integrating factor (IF)
\rightarrow	Integrating factor for a first order first degree differential Equation may on may not Exist.
	Equation may on may not Exist.
	u b b c
\rightarrow	Consider the first order first degree differential Equi
	x dy - y dx = 0. is non-Exact
	Choose $\phi(x,y) = \frac{1}{x^2} + \frac$
	$\frac{1}{\chi^2} \left(\chi dy - y dx \right) = 0 \Rightarrow \frac{1}{\chi} dy - \frac{y}{\chi^2} dx = 0 \text{ is an}$
	exact del con.
	$M = \frac{4}{2^2}$ $M = \frac{4}{2^2}$ $M = \frac{4}{2^2}$
	JANUAR GRANDE
	$\frac{\partial M}{\partial y} = \frac{-1}{x^2}$ and $\frac{\partial N}{\partial x} = \frac{-1}{x^2} \Rightarrow \text{Equ'' is Exact}$
	: \$(x,y) = 1 is an IF for Equal() +x \$0.
Ch	$\frac{\partial x}{\partial x} \frac{\partial (xy)}{\partial y^2} = \frac{1}{y^2} \frac{(x dy - y dx)}{y^2} = 0 \Rightarrow \frac{x}{y^2} dy - \frac{1}{y} dx = 0$
	M=-1, N= x 3M/3y= 1/y2 3N/3x= 1/y2 => Qu'is Exact
	2M/2y= 1/2 2N/2n= 1/2= 4u is Exact







	Date
Que	[y+xf(x2+y2)]dx + [yf(x2+y2)0-x]dy=0 Page
	$M = y + x f(x^2 + y^2); N = y f(x^2 + y^2) - x$
	$\frac{2M}{2y} = (+ \chi f'(\chi^2 + y^2) (2y)$
	34
	= 1+ 2xy f'(x2+y2)
	$\frac{\partial N}{\partial x} = y f'(x^2 + y^2)(2x) - 1 = 2xy f'(x^2 + y^2) - 1.$
	=) Epin (i) is not Exact.
	My-Nx = 1+ 2xy = 1+2xy = 1x2+y2)-2xy=1x2+y2)+1
	= 2
	S.T. is an T.F.
	22+y2 (y+x = (x2+y2)) dx + [y=1x2+y2)-x] dy=0
- 1	2744
1	24 = (x742)[1+ 2xy f'(x2+y2)] - (9+x f(x2+y2)[24]
	$= \chi^2 + y^2 + 2\chi y(\chi^2 + y^2) + (\chi^2 + y^2) - 2y^2 - 2\chi y + (\chi^2 + y^2)$
- 1	$\left(2\lambda^{2}+y^{2}\right)^{2}$
	$=$ $\chi^2 + \chi^2 + $
	= x2-y2+ 2xy(x2+y2) f(x2+y2) -2xy f(x2+y2)
	$(x^2+y^2)^2$
	$\frac{\partial N}{\partial x} = \frac{(x^2 + y^2) \left[y + \frac{1}{x^2 + y^2} (2x) - 1 - \frac{(y + \frac{1}{x^2} + y^2) - x}{(-2x^2)^2} \right] (2x)}{(-2x^2)^2}$
- 41	$(\chi^2+y^2)^2$
	$= 2xy(x^2+y^2)f'(x^2+y^2) - x^2-y^2 - 2xyf(x^2+y^2) + 2x^2$
	$(x^2+y^1)^2$
	= 22-y2+ gry (x2+y2) f(x2+y2) - 2xy f(x2+y2)
	(5x2+y2)2

 $\frac{\int_{M} (x+y+1)dx + (3x+3y+1)dy = 0}{3M} = 1; \frac{\partial N}{\partial x} = 2$

Not Exact diff Epu". Let V= x+y

 $V_{x=1}$, $V_{y=+1}$

 $\frac{M_{y}-N_{x}}{N_{y}-M_{y}} = \frac{1-2}{(2x+2y+1)-(x+y+1)}$

 $\phi(u) = e^{\int \frac{1}{x+y} d(x+y)} = e^{\int \frac{1}{x+y} d(x+y)} = e^{\int \frac{1}{x+y} d(x+y)}$

 $\frac{1}{x+y}\left[\frac{1}{(x+y+1)}dx\right] + \frac{1}{(x+y-1)}dy = 0$

M= x+y+1; N= 2(x+y)+1

M = 1+ 1 ; N = 2+1

35 (X+4)2 ; 3x (X+4)2

Son in Sittle de + Sady = C

2+ lef hay + 2y = c =) (x+2y)+ lef(2+y) = c.

