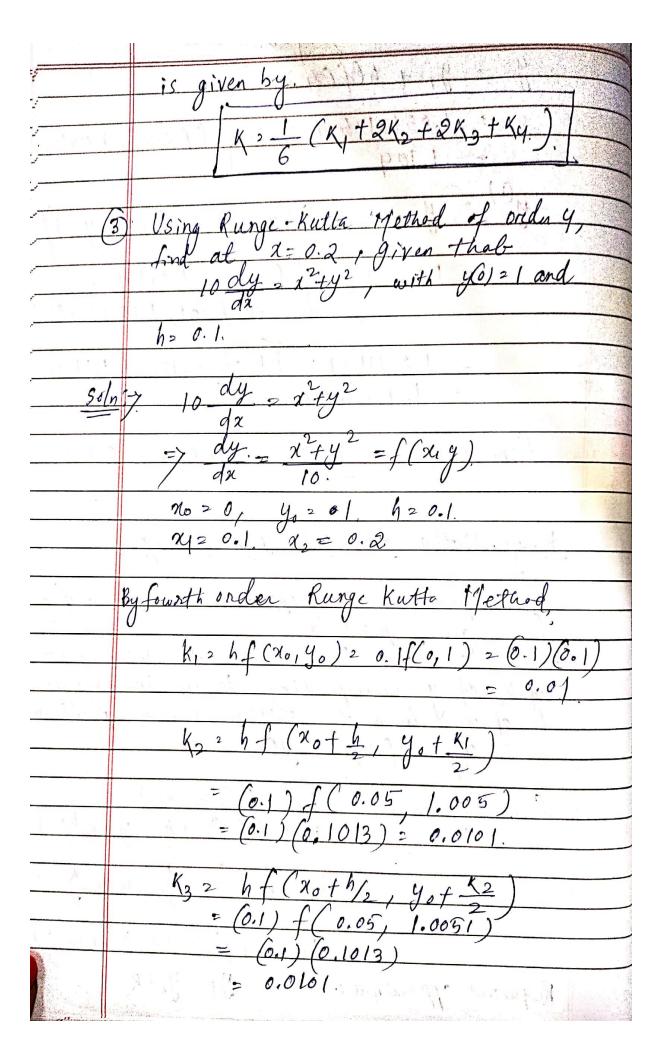
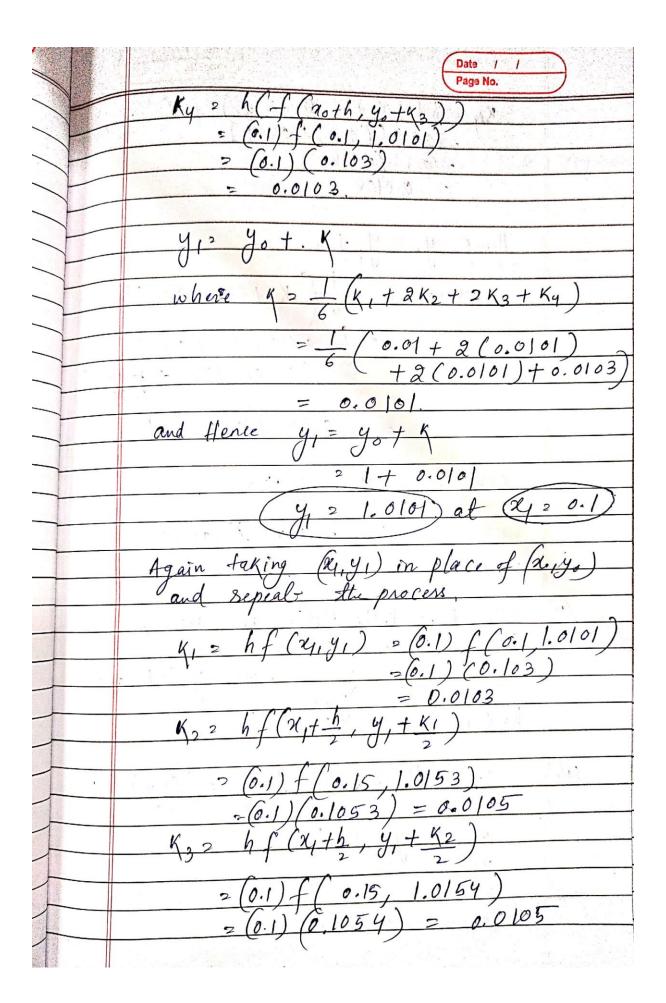
1-3 -3 10 ,3- 3
Ruge-Kutta 4th orda Methods 37
Jes a given point à
> It is used for finding the increment
> It is used for finding the increment of K of y. Corresponding to an increment h of x form the initial value problem
di (My)) J(ko) Zgo
Somula given by: K12 hf (xoth, yot-K1) K2 = hf (xoth, yot-K1)
$K_3 = hf\left(n_0 + \frac{h}{2}, y_0 + \frac{K_2}{2}\right)$
Ky=h(f(xoth, yotx3)) Required approximate value. y12 yotx.





Ky = h f (xy + h) y 1 + K 3)
(0.1) f(Co.2) (1.0207)
20.0108. (0.108.2)(1.0)
2 0.0 08
Hence y = y; + x.
whene $K = \frac{1}{6} \int_{0}^{4} K_{1} + 2K_{2} + 2K_{3} + K_{4}$
=======================================
$=\frac{1}{6}\left(0.0103 + 2(0.0105)\right) + 2(0.0105) + 2(0.0105)$
$= \frac{1}{(0.0631)^2} = 0.01051$
and Hence y 2 y + K
or (y2 = 1.0207) at (x2=0,2.).
(9) Using Runge Kutta Method, of order 4,
- (ad u(a,d) aiven the
$\frac{dy}{dx} = \frac{y-x}{y+x} $ with $y(0)=1$, and
h=0.1.
sobis liven theils dy y-x = f(xy)
$\frac{dx}{dx} = \frac{y-1}{x}$
20, y=1, h=0.1
$n_2 = 0.2$

	Date / / Page No.
	fourth order Runge kulta Melhod;
	$(1 = n + (n_0, y_0) = (0.1) + (0,1) = (0.1)(1) = 0.1$
	$K_1 = hf(x_0, y_0) = (0.1)f(0,1) = (0.1)(1) = 0.1$ $K_2 = hf(x_0 + \frac{h}{2}, y_0 + \frac{K_1}{2})$
	= (0.1) + (1.05 1.05)
	= (0.1) f (0.05, 1.05) $= (0.1) (0.9091) = 0.0909$
	The state of the s
	$K_3 = hf\left(x_0 + \frac{h}{2}, y_0 + \frac{K_2}{2}\right)$
7	= (0.1) f (0.05, 1.0455) 2 (0.1) (0.9087)
1	2 (0.1) (0.9087)
	0.0909
	Ky 2 h. f(xo+h), yo + K3)
	= (6.1) f(0.1) [1.0909]
	=(0.1)(0.8321)=0.0832
	U. 2 U + K
	y = y + K
	where 4 = = (K1+2K2 + 2K3 + K4)
ч.	+2(0.0909) + 0.0832)
	Ta(0.0909) + 0.0832)
	= 10.09113
	11 110 - 10011 at 0202
	$y = y_0 + K = 1.0911$. at $x_0 = 0.2$
	There is a second of the secon

