

Government Polytechnic, Ahmedabad

Science and Humanities Department

Engineering Mathematics

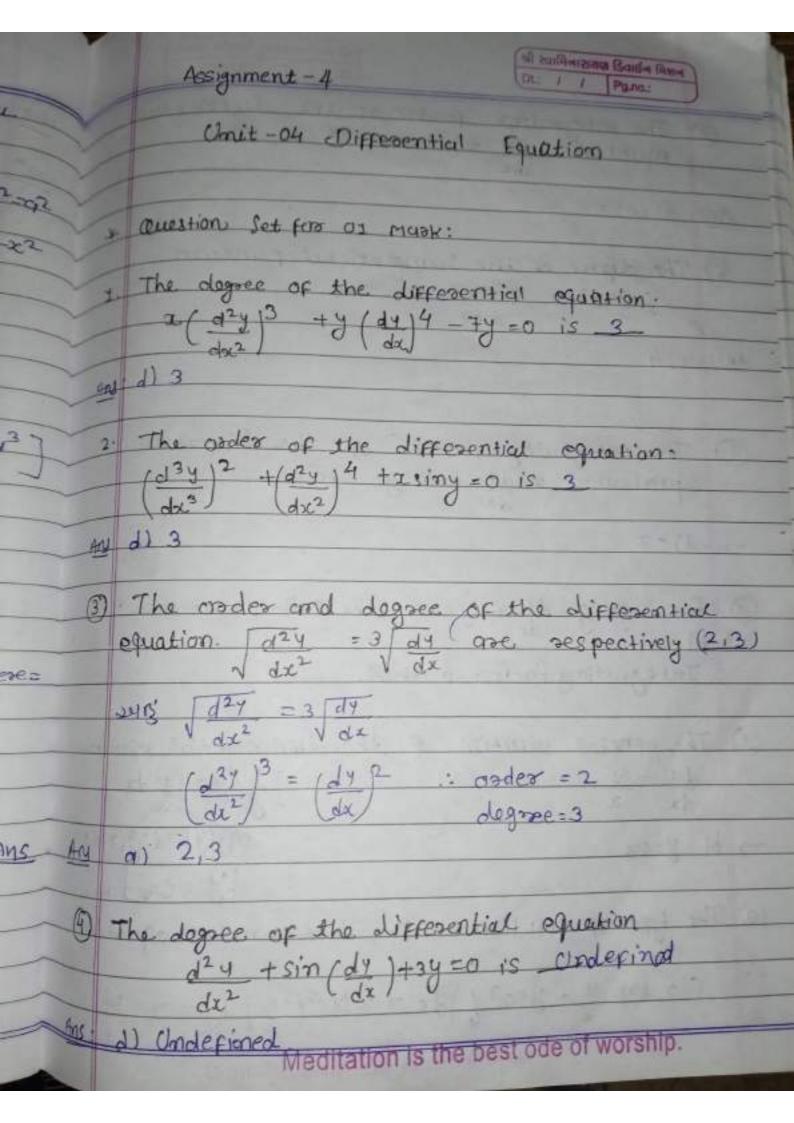
Subject Code: 4320002

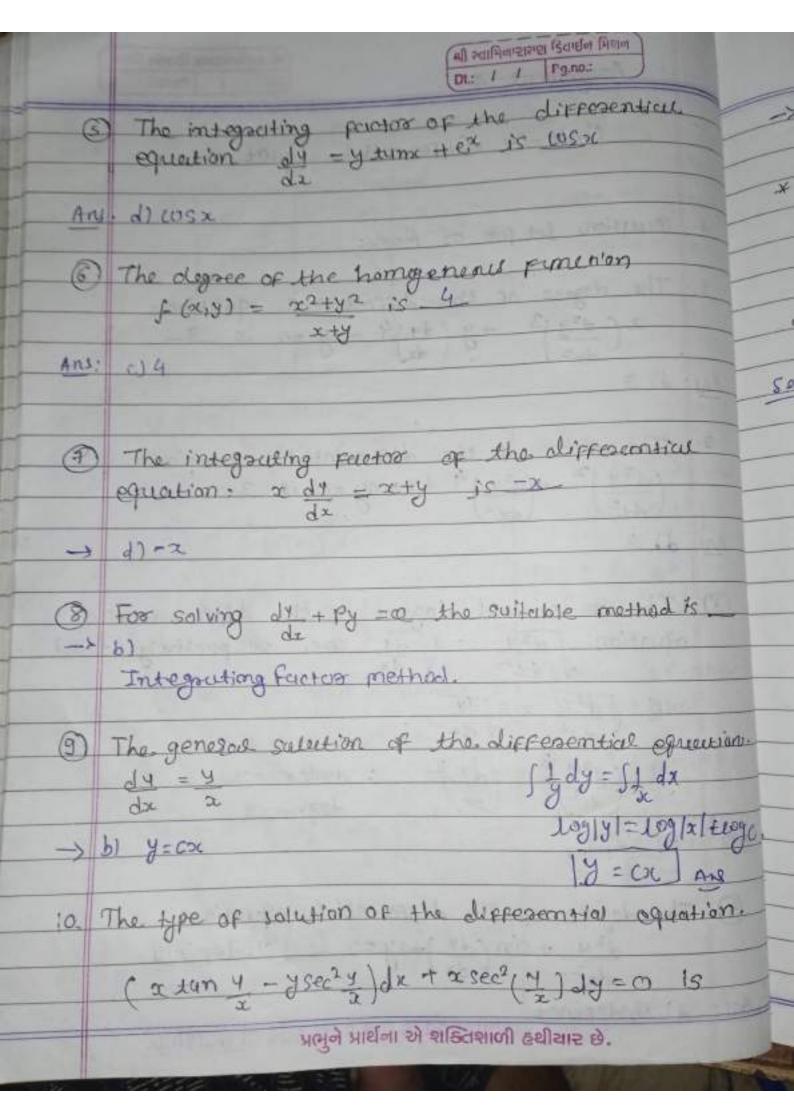
Unit -04 Differential Equation

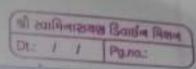
[Marks - 12]

Course Outcome (CO d):

Develop the ability to apply differential equations to significant applied problems.







2 a) Homogeneous so method

question bet for 03 marks:

1. Salve the foodlowing Differential equations:

a) temy da + tem x sec2y dy = 0

su" tunydx = - tunx sec2ydy

tiny - tune sec2y dy

dunx Juny tunk tiny

Coividing both the sider

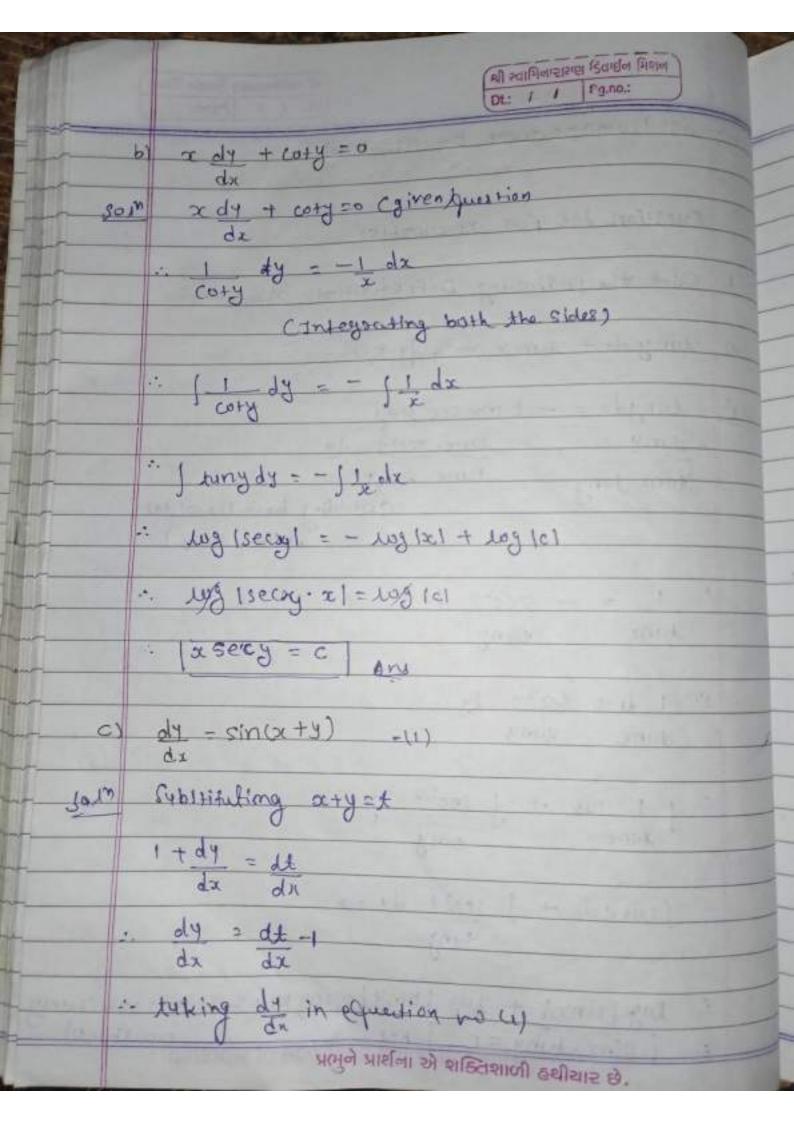
 $\frac{1}{tunx} = -\frac{sec^2y}{tuny} dy$

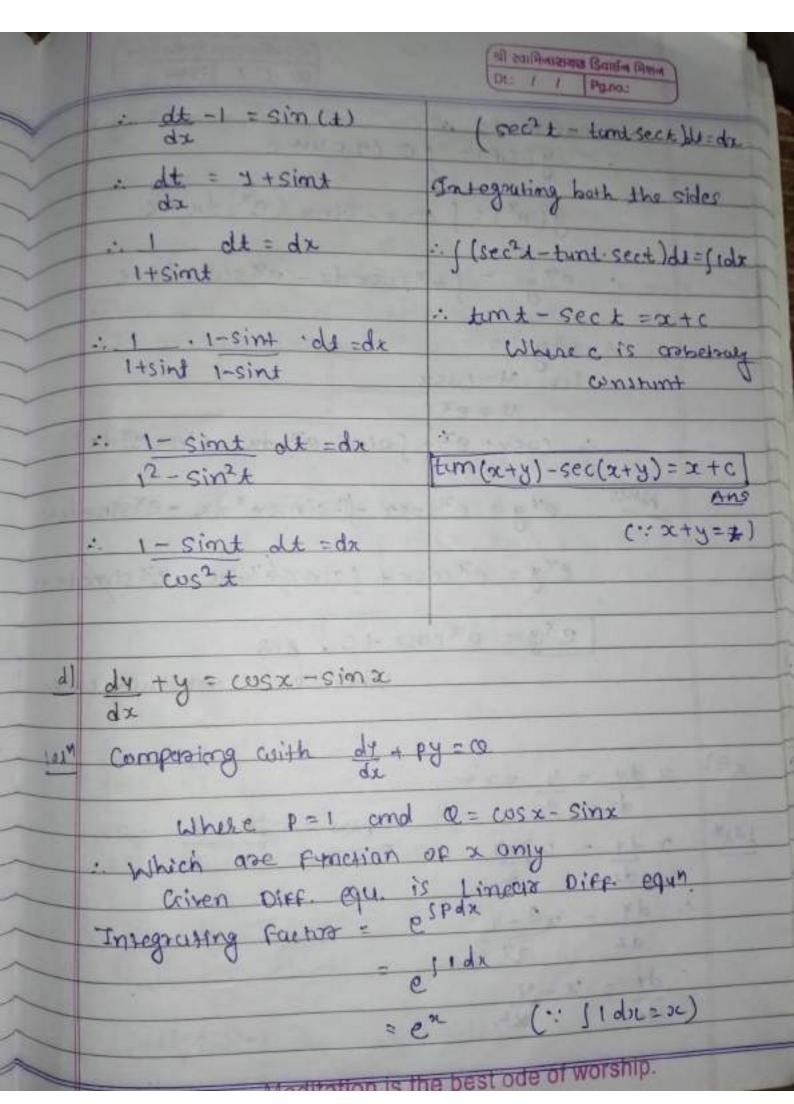
tunk tuny

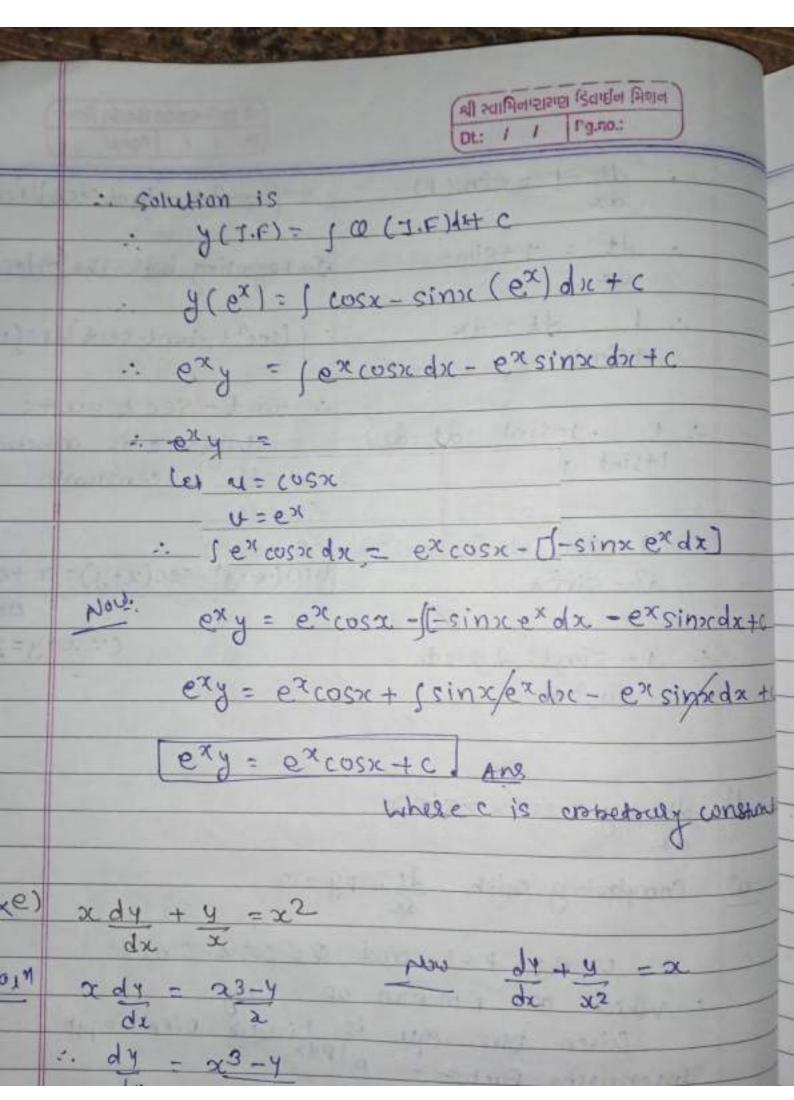
tunx tony

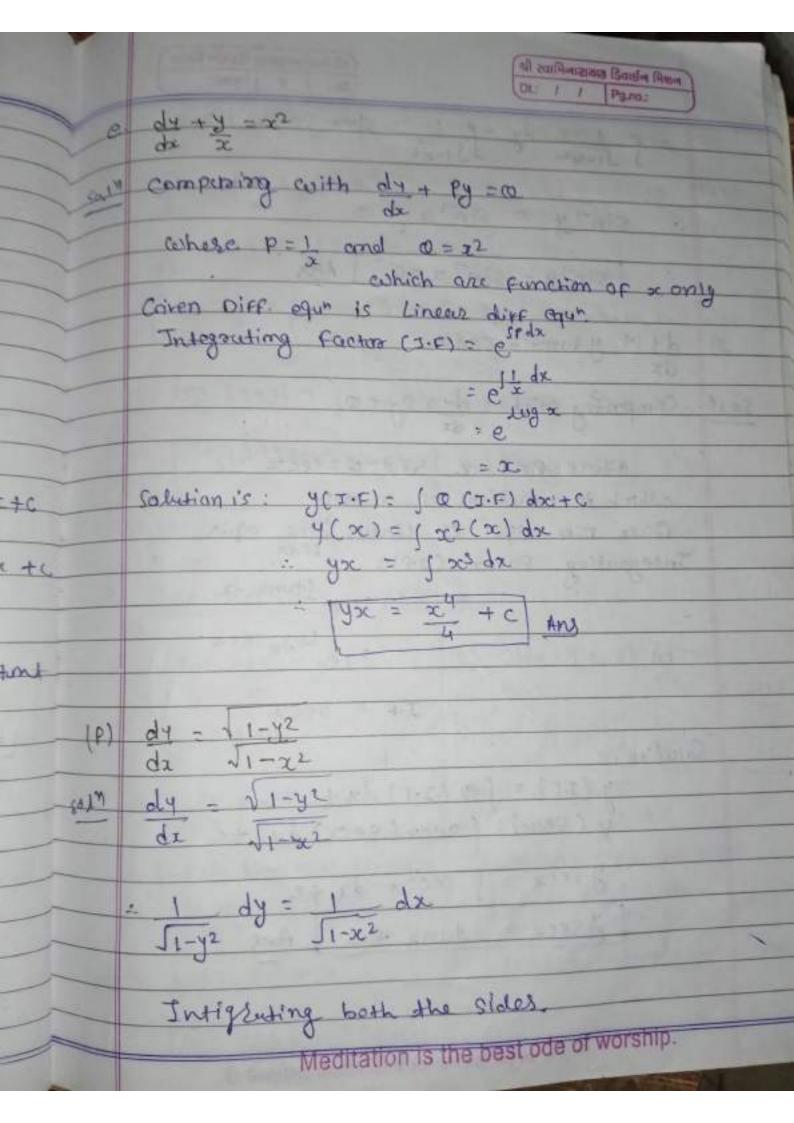
= Jeutredie + J secty dy =0

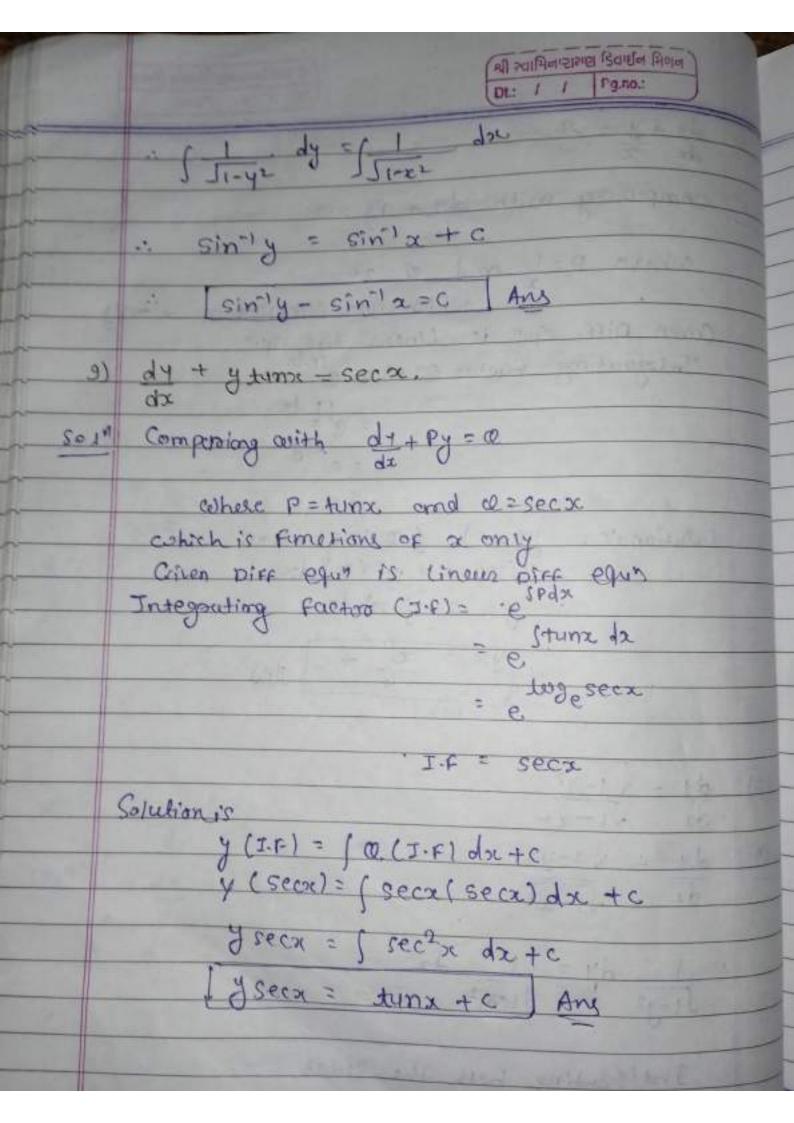
: Lug | sinx | + Lug | buny | = Lug | p | when c is as b itserry
: Sinx - Lyny = C | Any | best ode of worship.

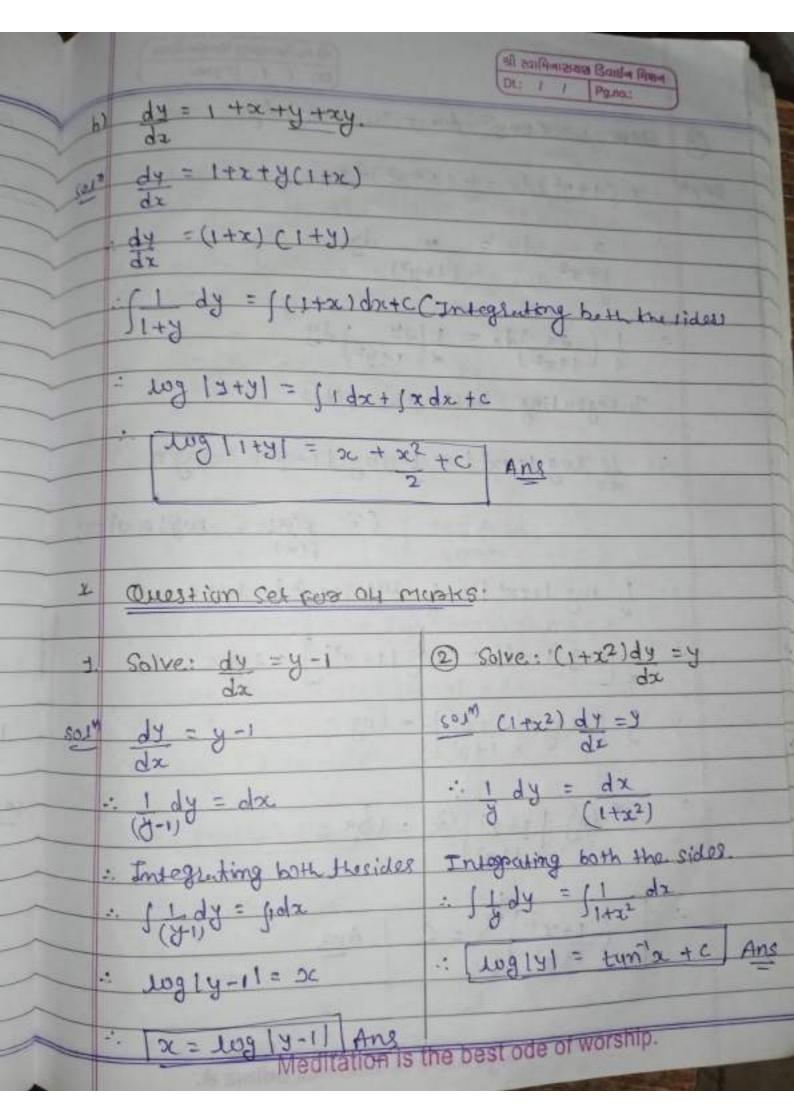


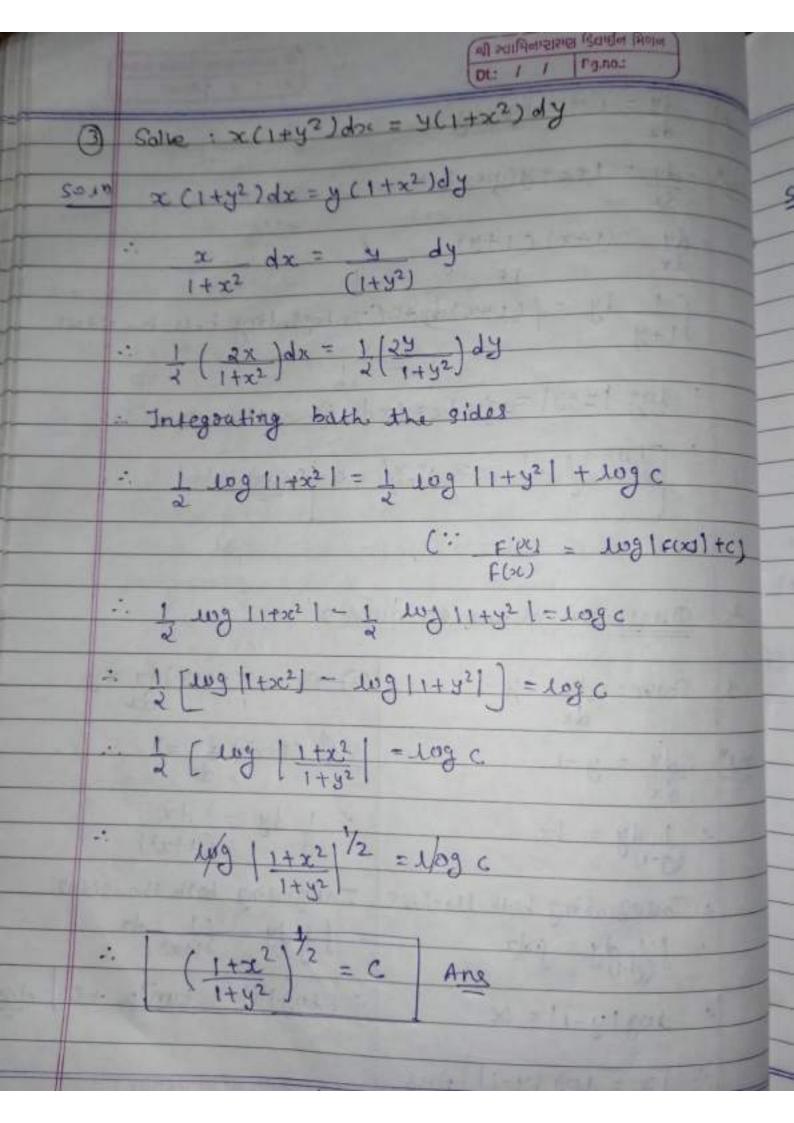












Solve sec'x tuny dx + secy tunxdy = 0

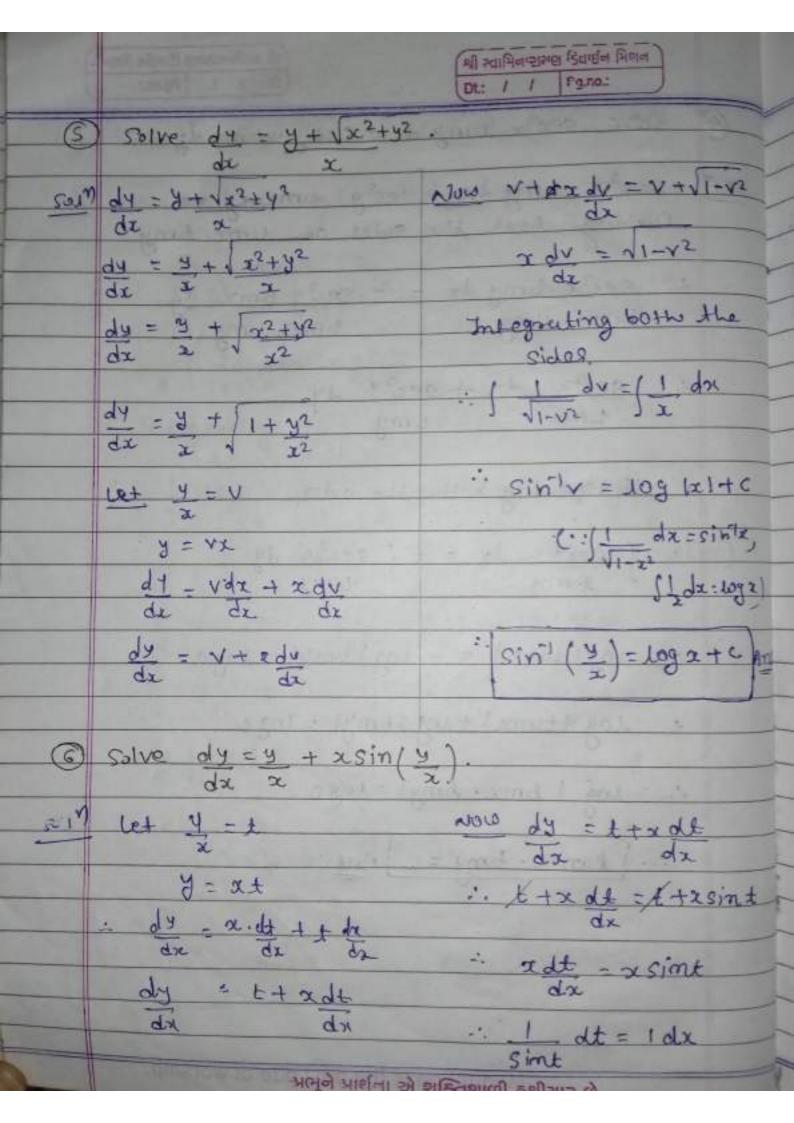
ser sec2x timy dx + sec2y timx dy =0

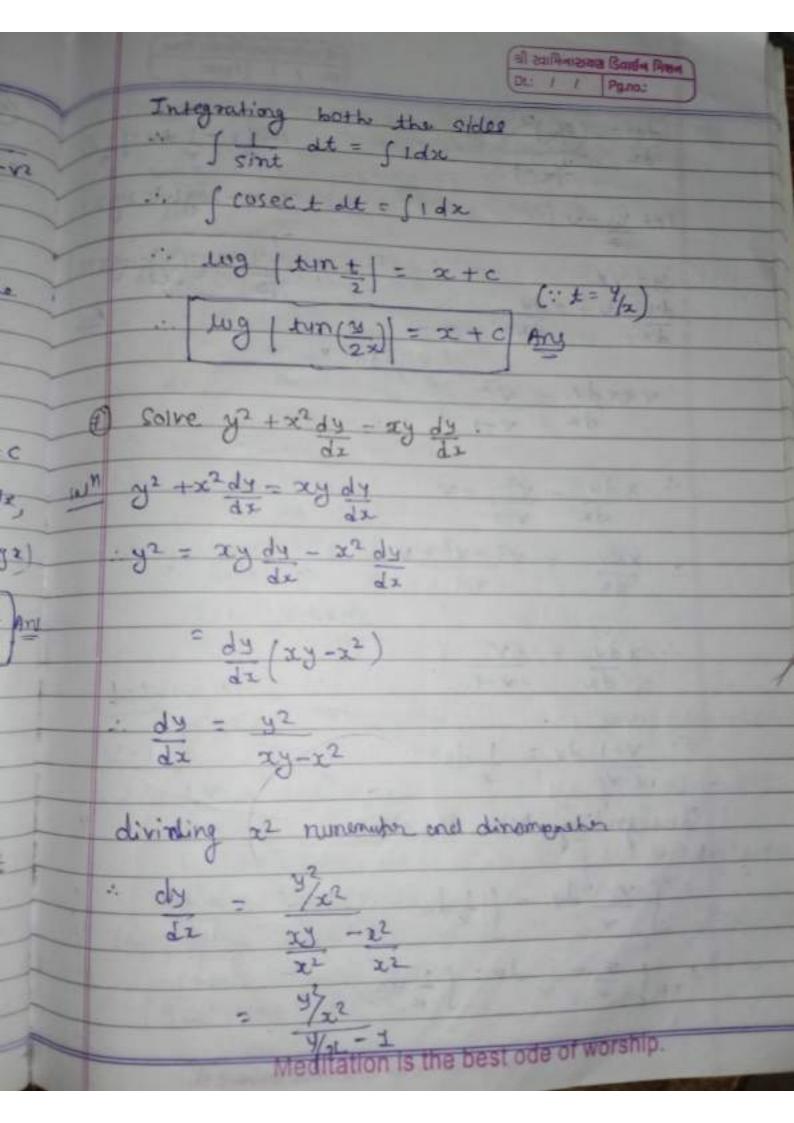
Dividing both the sides of time timy

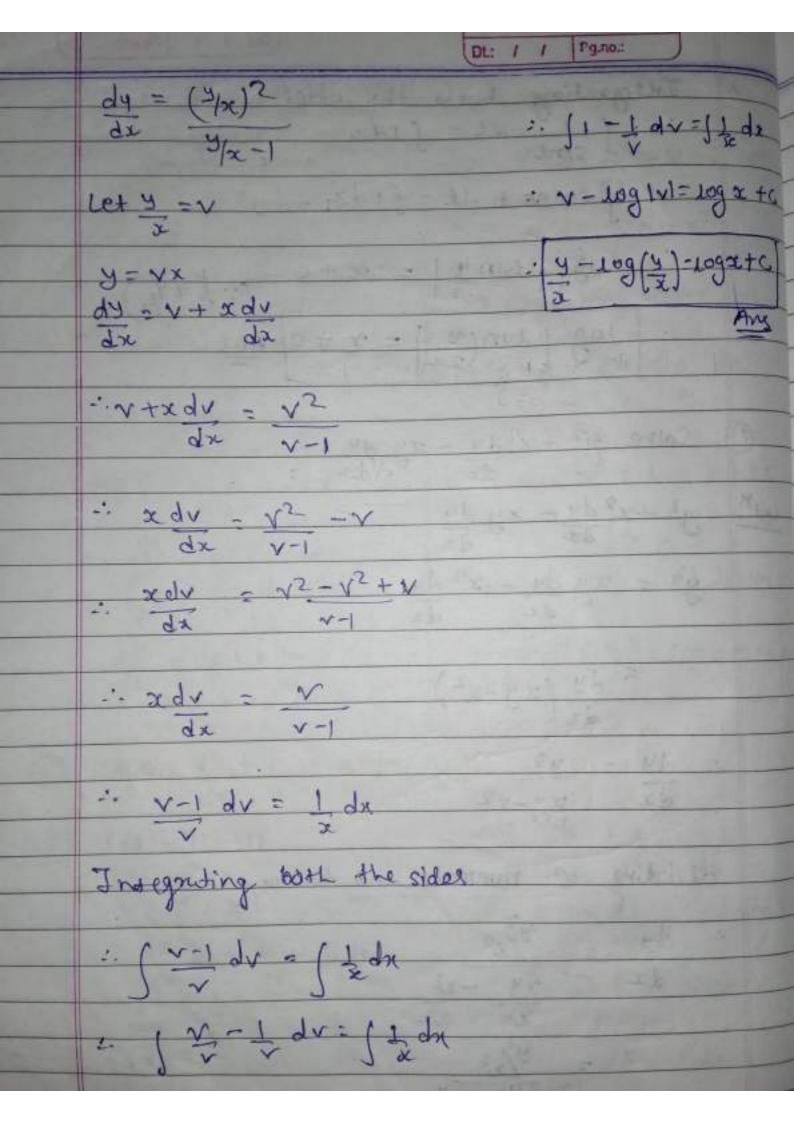
- = sec2x.tumy dx = sec2y tumx dy
 tumx.tumy tumx.tumy
- : sec2x doc = -sec2y dy

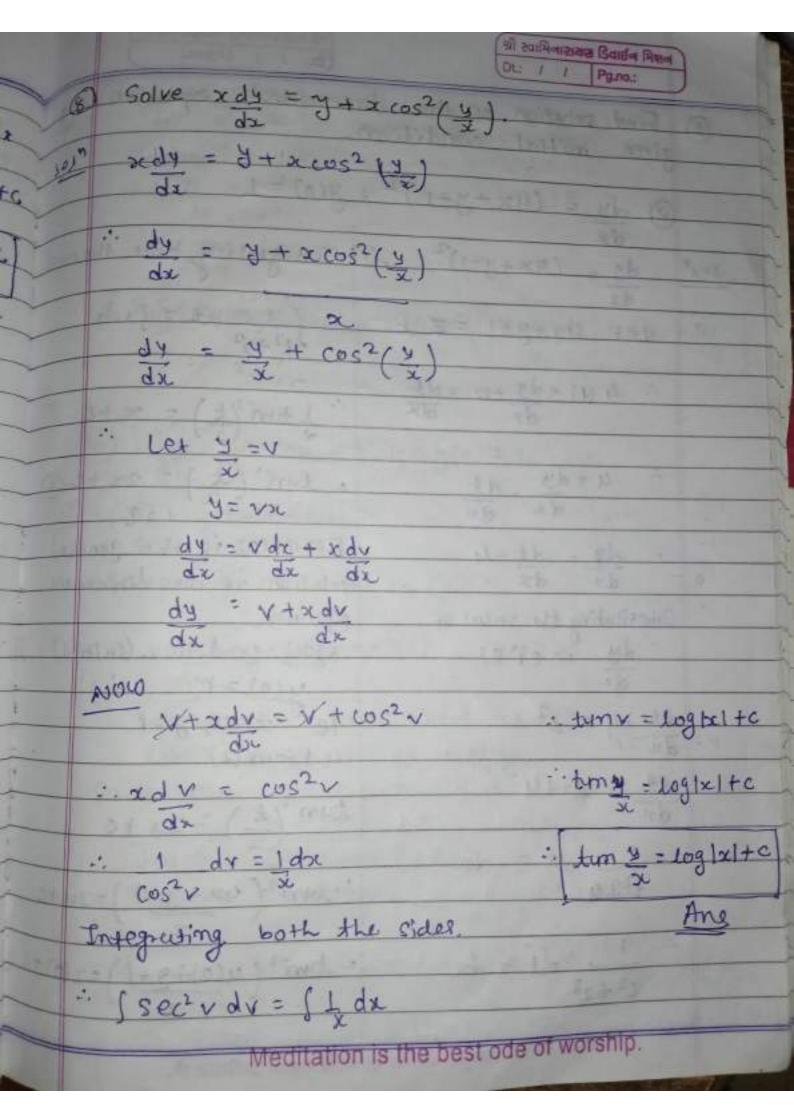
Integriting both the sides.

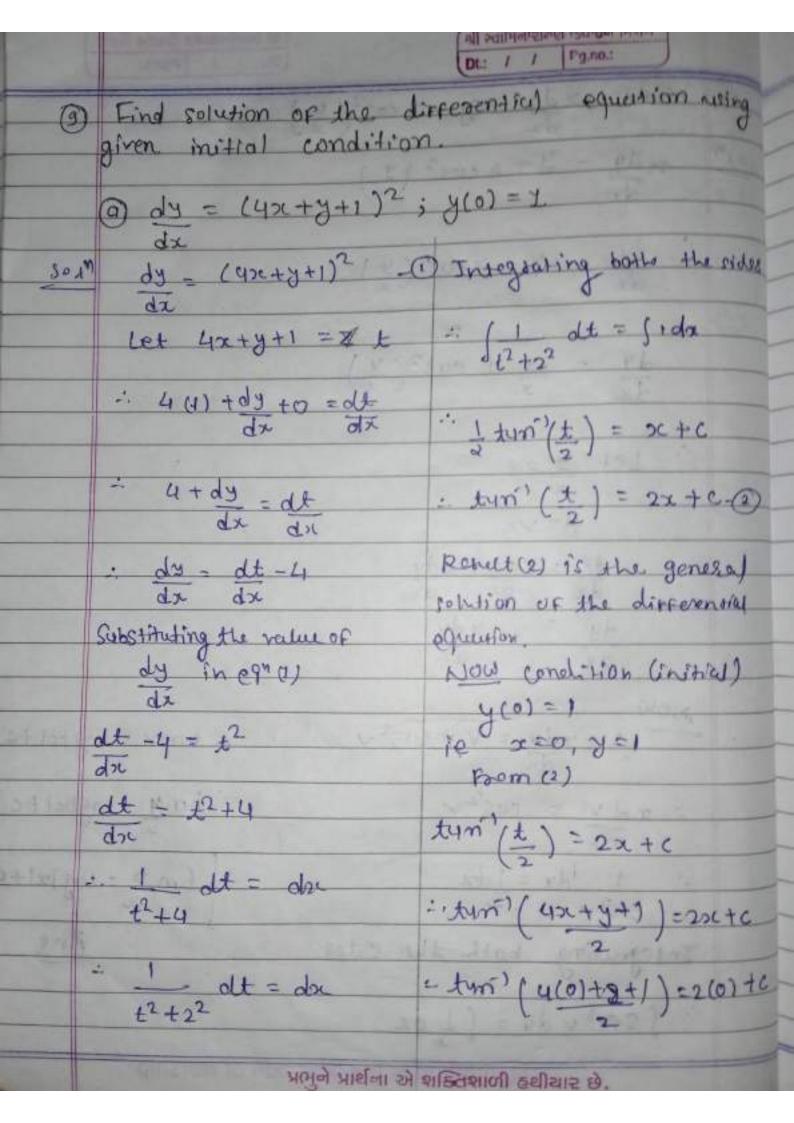
- . Sec2x dx = Sec24 dy
 tempe
- : 109 | trnx. 1 = lug | tmy 1 + log c
- . log I trime I they I trimy I = loge
- : 199 1 timx. timy 1 = 10/9 c
- : [tun x · tuny = c] Ans

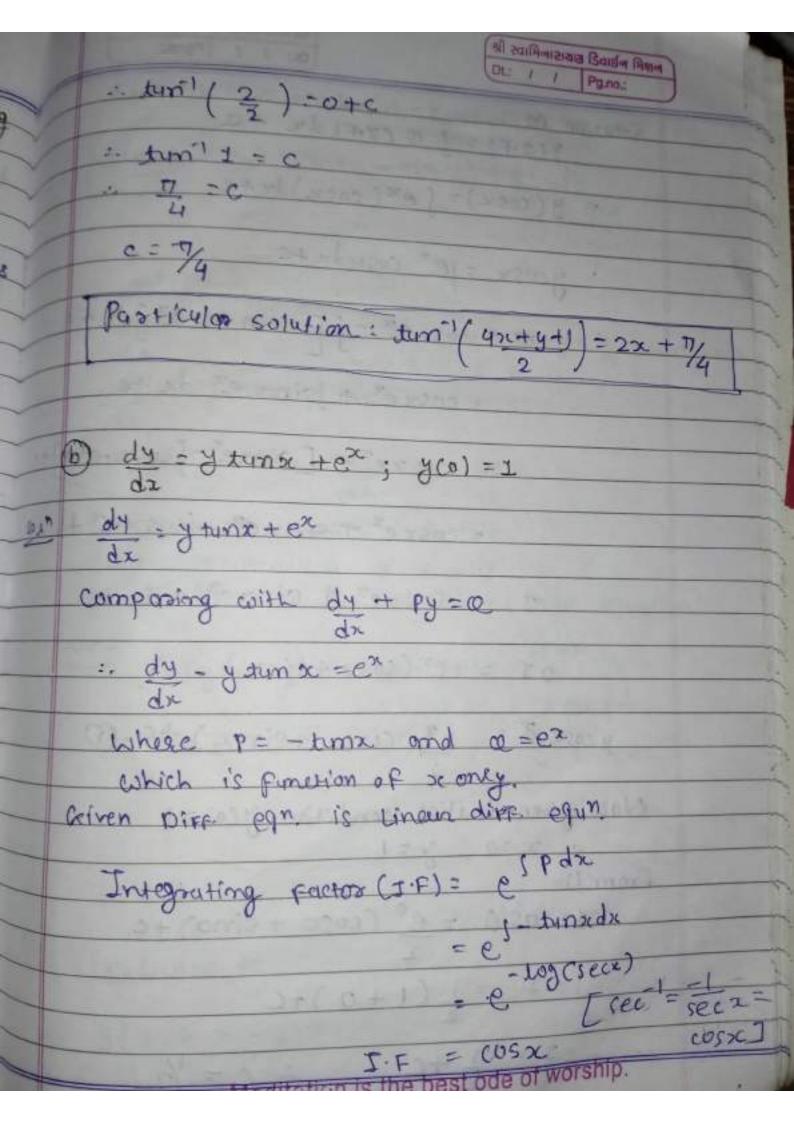












Solution is Y(I.F) = 1 @ (J.F) dx +C · y(cosx)= (ex(cosx)dx+c · yousx = |e = cossedne+c = y cosx = cosx ex - [c-sin & · ex] dx + c = cosnex + sime ex dx +c - cus zex + [sinxex- (cosx .ex dx) +c = cosxex + sinnex - (cosx ex dx I = cosxex + sinxex = I 2I = ex(cosx+sinx) y cosx I = ex (cosx + sinx) +c. (i) Now given initial condition y(0)=1 · x=0, y= From(i) 1. cos 0 = e0 (coso + sino) + c 1.1 = 1 (1+0)+0 र्य = 1 +C : C = /2 रिल्म प्रार्थना એ शस्तिशाणी हथीयार छे.

From (i) the publiculus solution is

$$\frac{3\cos\alpha}{2} = \frac{e^{-\alpha}}{2} \left(\cos\alpha + \sin\alpha \right) + \frac{1}{2} \left| \frac{1}{2} \right|$$

solution is.

Meditation is the best ode of worship.

