

CASE (anth) | cos (anth) | cos (anth)

(0² → -a²)

=> P.7 = 1 Sin(anth) | cos(anth)

y" -y" + 4y' - 4y = sin 3 m

Soin D3- D2y + 40y -4y = 5:034

=> m3-m2 +4m-4=0

m1 = 1 , m2 = -2i , m3 = 2i

de = clex + cowsen + cosinen

 $y_p = \frac{1}{f(n)}x = \frac{1}{n^3 - n^2 + 4n} + 4$

 $D^2 \rightarrow (-\alpha^2) \rightarrow (-9)$

=> 1 Singn

E SINSX

 $= \frac{1}{f(-a^2)} \sin(ax+b) / \cos(ax+b)$

5-5D 8199K

3) 1 x (5+50) gingx

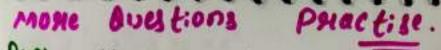
5+5D 3:03x (0° -> -9)

5 + 50 8:ngx

3) 81 n3x + 3 cuisx

mily g = yc +yp

=) Y= c1ex + c2 cullu. + c3 sinex + Singh + 3 cobsh Am



$$\int_{3}^{3} \frac{(m-1)(m+2)(m-3)=0}{(11^{-2})} \frac{(11^{-2})^{2}}{(11^{-2})^{2}}$$

$$\int_{3}^{3} \frac{d^{2}}{d^{2}} \frac{c_{1}e^{x} + c_{2}e^{2x} + c_{3}e^{3x}}{(11^{-2})^{2}}$$

$$y_p(n) = \frac{1}{f(n)} x = \frac{1}{n^3 - 20^2 - 5046}$$

$$\frac{1}{0^{3}-20^{2}-50+6} - \frac{1}{0^{3}-20^{2}-50+6} = \frac{1}{0^{3}-20^{2}-50+6}$$

$$\Rightarrow \frac{1}{-1-2+5+6} + \frac{1}{8-8-10+6}$$

$$=> \frac{4e^{-x}}{8} - \frac{1}{-4}e^{2x}$$

$$\frac{1}{3} \frac{e^{-x} + \frac{e^{2x}}{4}}{e^{-x} + \frac{e^{2x}}{4}}$$

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$$\frac{1}{3} \frac{e^{-x} + \frac{e^{2x}}{4}}{e^{-x} + \frac{e^{-x}}{4}}$$

$$\frac{1}{3} \frac{1}{4} \frac$$

Ans.

$$-\frac{1}{\beta(0)}X = \frac{1}{0^3 - 0^2 - 0 + 1}$$

$$\Rightarrow \frac{1}{1-1-1+1} e^{x} = \frac{e^{x}}{0}$$

$$\frac{1}{J'(D)} \Rightarrow \frac{x}{3D^2 - 2D - 1}$$

$$\frac{x \cdot x e^{ax}}{60 - 2} = \frac{x^2 e^{x}}{60 - 2}$$

ettettettiiiiiiiiiiii

$$y_{p} = \frac{1}{f(0)} \times = \frac{1}{5^{2} + 4} \cos 2x$$

$$(5^{2} = -9^{2} = -4)$$

$$\frac{1}{-4+4} \quad \text{tob2} \times$$

$$\frac{1}{2} \frac{x \cos 2x}{2} \Rightarrow \frac{x}{2} \cdot \frac{1}{2} \cos 2x \Rightarrow \frac{x}{2} \int \cos 2x = \frac{x}{2} \frac{\sin x}{2}$$

$$\Rightarrow \frac{x \sin 2x}{2} \Rightarrow \frac{x}{2} \cdot \frac{\sin x}{2}$$

Ans.

Cultullinin)

Quel y + 5y" + 4y = 16 8inx + 64 cox1x

Solu. Dy+ = 03 +4 = 16 8:10x +640082x

m1= ±i , m2 = ±2i

de = cycosx + cysinx + cycosx teysinax

yp = 1/(0) x = 1/(02) x = 1/(-02) x

 $\frac{168:0 \times }{0^{4} + 50^{2} + 4} + \frac{64 \cos x}{0^{4} + 50^{2} + 4}$

(0°=-1) (0°=-4)

→ 16 S;nx + 64 CUBEX 1-5+4 16 -20+4

=) 16 sinx + 64 corex

=> x.16 Sinx + x.64 COSSX 403 + 100 16x sinx + 64x cusex = 5 = 5 integral = 100 + 100

=) 16x 8inx + 64x col 2x

\$ 16x 55:00 0 - 664x 5 COB2M

3 -8x colx - 31x 8; n2x

=> -8 x cosx - 16x sin2x

: General 8017: y= ye +yp

= = c1 cvsx + e2 sinx + c3 cm2x + c4 sin2x

 $-\frac{8 \times \cos 3 \times}{3} - \frac{16 \times}{3} \sin 2 \pi$

case 3 when x=x"

$$P \cdot I = \frac{1}{f(b)} \times = \left[1 + \phi o \right]^{-1}$$

•
$$(1+p)^{-2} \rightarrow 1-20+30^2-40^3+$$

$$\beta \rho = \frac{1}{\mu \omega} X = \frac{1}{[1+\phi 0]} X$$

$$= \frac{64}{0^2 + 16} \times 2$$

•
$$(1-D)^{-1}$$
 $\rightarrow 1+D+D^2+D^3+...$ Expand according to the type of expansion $\frac{64 \times 2}{16(\frac{D^2}{16}+1)}$ $\frac{4 \times 2}{[1+(\frac{D}{4})^2]}$

$$(1-b) \rightarrow 1+25+35 + 45 + ... \Rightarrow 4[1+(\frac{5}{18})]^{2} \chi^{2}$$

$$(1+5)^{-2} \rightarrow 1-25+35^{2}-45^{3}+... \Rightarrow 4[1+(\frac{5}{18})]^{2} \chi^{2}$$

CHARLECT CONTROL OF THE STREET

$$800^{3} \quad y'' + 25y = 9x^{3} + 4x^{2}$$

$$80^{3} \quad 2^{3}y + 25y = 9x^{3} + 4x^{2}$$

$$\Rightarrow \frac{9x^3}{D^2 + 25} + \frac{4x^2}{D^2 + 25}$$

$$\Rightarrow \frac{9}{25} \left(\frac{1}{1 + (2)} \right) x^{3} + \frac{9}{25} \left(\frac{1}{1 + 2} \right) x^{2}$$

$$\Rightarrow \frac{9}{25} \left[1 + \frac{0^2}{25} \right]^{-1} x^3 + \frac{4}{25} \left[1 + \frac{0^2}{25} \right]^{-2} x^2$$

$$\Rightarrow \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^2}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^4}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^4}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^4}{25} + \frac{0^4}{25} \dots \right] \times \frac{9}{25} \left[1 - \frac{0^4$$

$$\frac{9x^3}{25} - \frac{9}{625} \cdot 6x$$
. $+ \frac{4x^2}{25} - \frac{4}{625} \cdot 2$

$$\frac{1}{3} \frac{3}{9} = \frac{9}{25} x^{\frac{3}{2}} + \frac{4}{25} x^{\frac{2}{2}} - \frac{54}{625} x - \frac{8}{625}$$

$$=) \frac{1}{3} = \frac{1}{25} \times \frac{1}{25$$

Ani.

$$) m^{2} + 6m + 9 = 0$$

$$m_{1} = m_{2} = 3$$

$$\frac{1}{3p} = \frac{1}{1(0)} \times = \frac{1}{C1 + 40} \times = \frac{1}{0^2 + 60 + 9} \times = \frac{1}{9} \times \frac{12x^2 - 16x + 5}{27}$$

$$\frac{1}{9} \left[\frac{1}{1 + (60 + 0^2)} \right] (4x^2 - 1)$$

$$\Rightarrow \frac{1}{9} \left[1 + \left(\frac{60 + 0^2}{9} \right) \right]^{-1} \left(4x^2 - 1 \right)$$

$$y(n) = (c_1 + c_2 x) e^{-3x}$$

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& Bustions FUH PHACTISE.

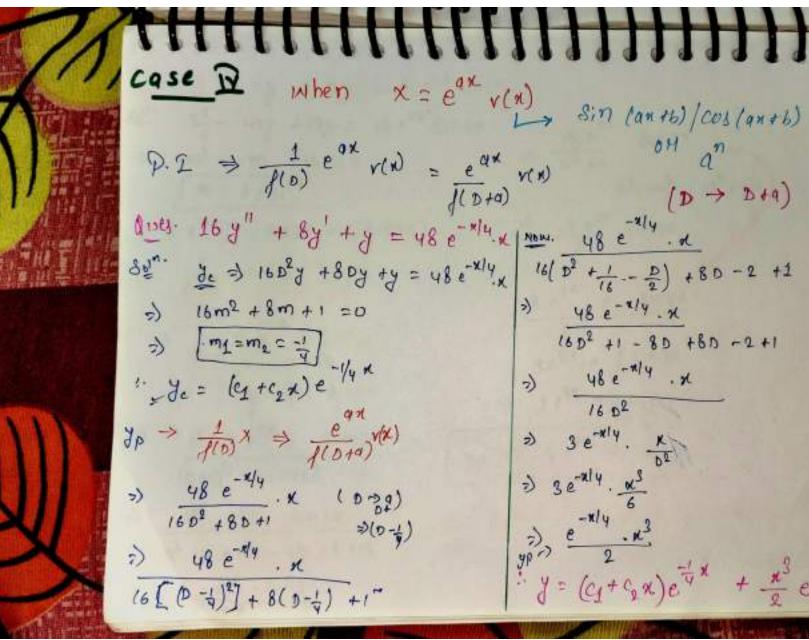
②
$$y'' - 3y' + 2y = e^{3x}$$
 ② $c_1 e^x + c_2 e^{2x} + \frac{1}{2} e^{3x}$

(3)
$$(5^2 + a^2)y = \cos ax$$
 (3) $c_1\cos ax + c_2 \sin ax + \frac{x}{2a} \sin ax$

$$(D^{2} + 4D + 4)y = e^{2x} - e^{-2x} \quad (c_{1} + c_{2}x)e^{-2x} + \frac{1}{16}e^{2x} - \frac{2}{x}e^{-2x}$$

(a)
$$c_1e^{x} + e^{-x/2} \left[c_2 \cos \frac{\sqrt{3}x}{2} + c_3 \sin \frac{\sqrt{3}x}{2} \right] + \frac{1}{4} e^{2x} + \frac{2x}{3} e^{x} - 1$$

- (1) $(0)^{8} + 90)y = 5in3x$ (1) $c_{1} + c_{2} cos3x + c_{3} sin3x x sin3x$
- y" -8y' +9y = 408105x (2) exx(c,cos v7x +c2510v7x) + 5 (5c085x -
- (3) (3) +9)y = cos2x + sin2x (3) c1cos3x + c2 sin3x + 1/5 (cosex + sin2x)
- (4) y" +y = cos x 8:n3x (4) c1 c08x + c2 8:0x -1 8:n4x 1 8:n2x
- (3) $(5^{4} 0^{2})y = 2$ (5) $c_{1} + c_{2}x + c_{3}e^{x} + c_{4}e^{-x} x^{2}$ (6) $(5^{4} 0^{4})y = x^{4}$ (6) $c_{1}e^{ax} + c_{2}e^{-ax} + c_{3}cosax + c_{4}sinax = [x^{4} + 0y]$
- (1) y" + 3y" +2y' = x (1) c1 + c2e + c3e-2x + x3 3x2 + 7x
- (B) (B3+8) y = x4 +2x+1 (B) c1 e2x +ex (c2c03 v3x + 3 sinxv3] + 1 (x4-x+1)
- (9) (04-203 +502-80+4)y=22 (4+e2x)ex + c3 cosex + c481n2x + 1 (x2 + 4x + 1/2)
- (20) y" + 2y' + y = 2x + x2 (0) (c1+c2x) ex + n2-2x +2



Sin
$$(an +b)/(cos (an +b))$$
 $V(n)$
 $(D \rightarrow D+4)$
 $V(n)$
 $(D \rightarrow D+4)$
 $V(n)$
 $V(n)$

Over. y" - 4y' + 13y = 18 e2x 8; n3x

$$y_p = \frac{1}{f(p)} x = \frac{e^{\alpha x} \cdot v(x)}{f(p+\alpha)}$$

$$\frac{18 \cdot e^{2\pi} \cdot \sin 3\pi}{(0+2)^2 - 4(0+2) + 13}$$

$$\frac{18 \cdot e^{2x} - \sin 3x}{0^{2} + 4 + 40 - 40 - 8 + 13}$$

$$\frac{18 \cdot e^{2x} \cdot \sin 3x}{p^2 + 9}$$

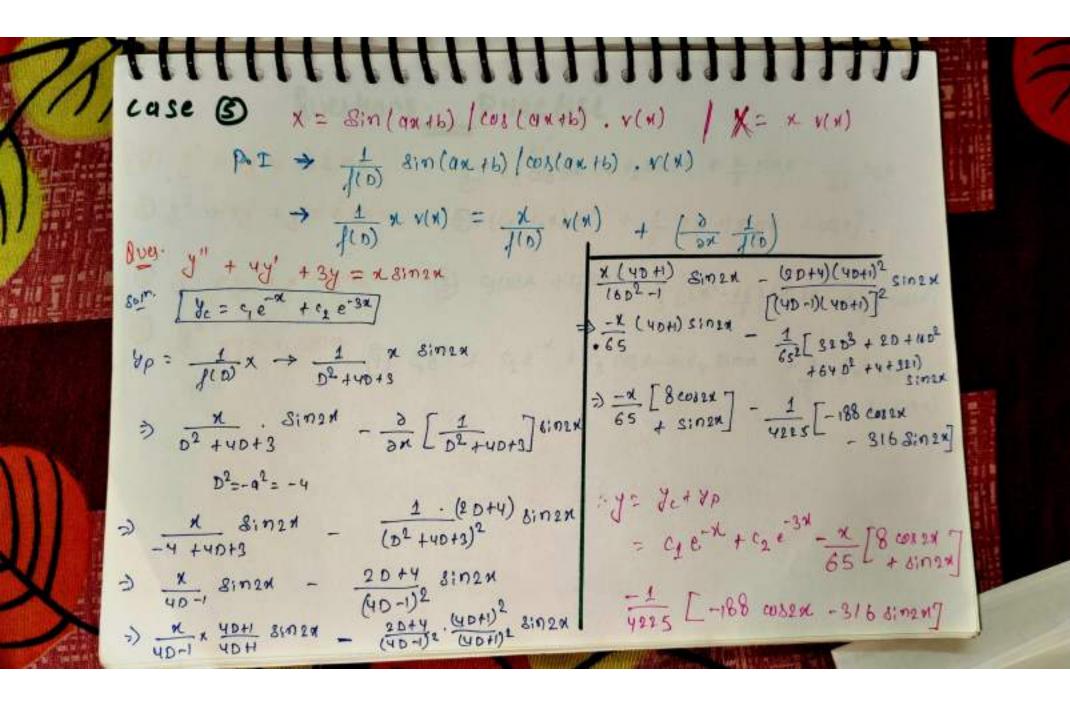
$$\Rightarrow \frac{18e^{2x}}{D^{2}+9} \sin 3x$$

$$\Rightarrow \frac{18e^{2x}}{D^{2}-a^{2}} = -3^{2} = -9$$

$$\Rightarrow \frac{18e^{2x}}{D^{2}} \sin 3x$$

A

avestions Practise (D-1)²y = $e^{x} se^{2}x + \tan x$ (D $yp = \frac{e^{x}}{2} (\tan x - x)$ (3) y"-3y'-2y = 540 e x 3 (3) c1 e2x + (2+13x) ex -ex [9x5 + 15x4 + 20x3 + 20x] (9) y"-y" + 3y' + 5y = ex cosx (1) c1ex + ex(c2cosex + c3sinex) + 1 ex(3sinx (5) $y'' + y'' + y = e^{-x/2} \cos(x \sqrt{3})$ (5) $e^{-x/2} \left[c_1 \cos \frac{\sqrt{3}}{2}x + c_2 \sin \frac{\sqrt{3}}{2}x\right] + e^{-x/2} \left[c_3 \cos \frac{\sqrt{3}}{2}x\right]$ (6) $y'' - 4y' + 4y = e^{2\pi} 8in2\pi$ (6) $(c_1 + c_2\pi)e^{2x} - e^{2x} 8in\pi$



Practise

(3)
$$y'' + y = x^2 \sin 2x$$
 (3) $c_1 \cos x + c_2 \sin x - \frac{1}{3} \left[(x^2 - \frac{26}{9}) \sin 2x + \frac{8}{3} x \cos 2x \right]$

$$\frac{1}{3} \left[(x^{2} - \frac{26}{9}) \sin 2x + \frac{8}{3} x \cos 2x \right]$$

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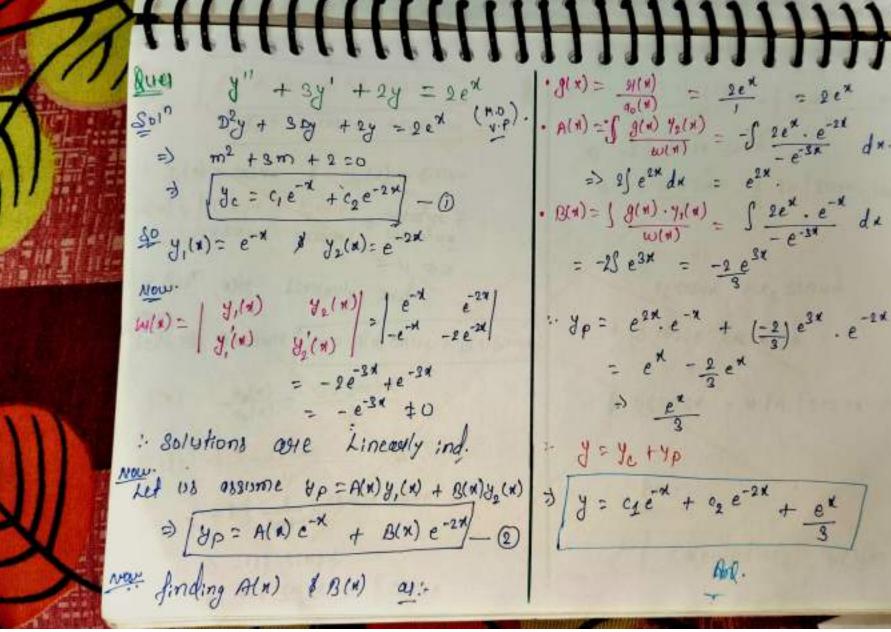
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Methods & radiations & panameters. 98(x)y" + 9,(x)y' + 9,(x)y = x(x) How to solve. 1) find y, 3? -> de= c1 y,(x) + c2 y2(x) 2) Check solutions we Linearly independent on dependent by whomskipn (win) win=?? 3 ASSUME [4p = A(N)4,(N) + B(N) 42(N); where A(N) & B(N) COME $A(x) = -\int \frac{g(x)}{\omega(x)} \frac{y_2(x)}{dx} dx \qquad A \frac{g(x)}{g(x)} = \frac{g(x)}{g_0(x)}$ (4) Now, write general solm as: B(m) = 1 g(m) y,(m) dn J= yc typ/



$$\frac{1}{3}(x) = \frac{y(x)}{4a(x)} = \frac{2e^{x}}{1} = \frac{2$$

80m ms+1=0 m=ti

1. 41(4) = cosx x y2(4) = 81 nx

: W(a) = | cost Sina | cost

2) cost x + sint x + 0

: Soin one Linearly and.

Let us assume particular soin as

 $Jp = A(x) y_1(x) + B(x) y_2(x)$ $= A(x) \sum_{c \in S} x + B(x) \sum_{s \in S} x - D$

 $g(n) = \frac{g(n)}{g_0(n)} = \frac{\text{cosect}}{2}$

= cosecx

 $A(n) = -\left(\frac{g(n) \cdot 12(n)}{w(n)}\right) = -\int \cos(nx) \cdot \sin(nx) dx \quad \left[\frac{1}{\cos(nx)} \cdot \sin(nx)\right]$ $= -\int 1 dx \quad = -x$ $= -\int 1 dx \quad = -x$ $= \int \cos(nx) \cdot \cos(nx) dx \quad \left[\frac{1}{\sin(nx)} \cdot \cos(nx)\right]$ $= \int \cos(nx) dx \quad = \int \cot(nx) dx$ $= \log \sin(nx)$ $= \log \sin(nx)$ $= \log \sin(nx)$

 $U1S = J_c + J_p$ $= c_1 cos x + c_2 sin x$ + (-x) cos x + cog(sin x). sin x

An

y,(+)=x, y2(x) = 1/x wie two Linearly independent solutions of xy" + xy'-y=x ,x to find general som.

=) [ye= cix + e2 +

 $w(x) = \frac{1}{1} \frac{x}{-1/x^2} = \frac{-1}{x} - \frac{1}{x}$ = -2 +0

: Soin oure Linearly ind.

Let us assume yo = A(m) y(n) + B(n)71(n)

A(n) = 1 \frac{1}{\frac{1}{2}} = \frac{1}{2} \sqrt{2}
\frac{1}{2} \logn = \frac{1}{2}

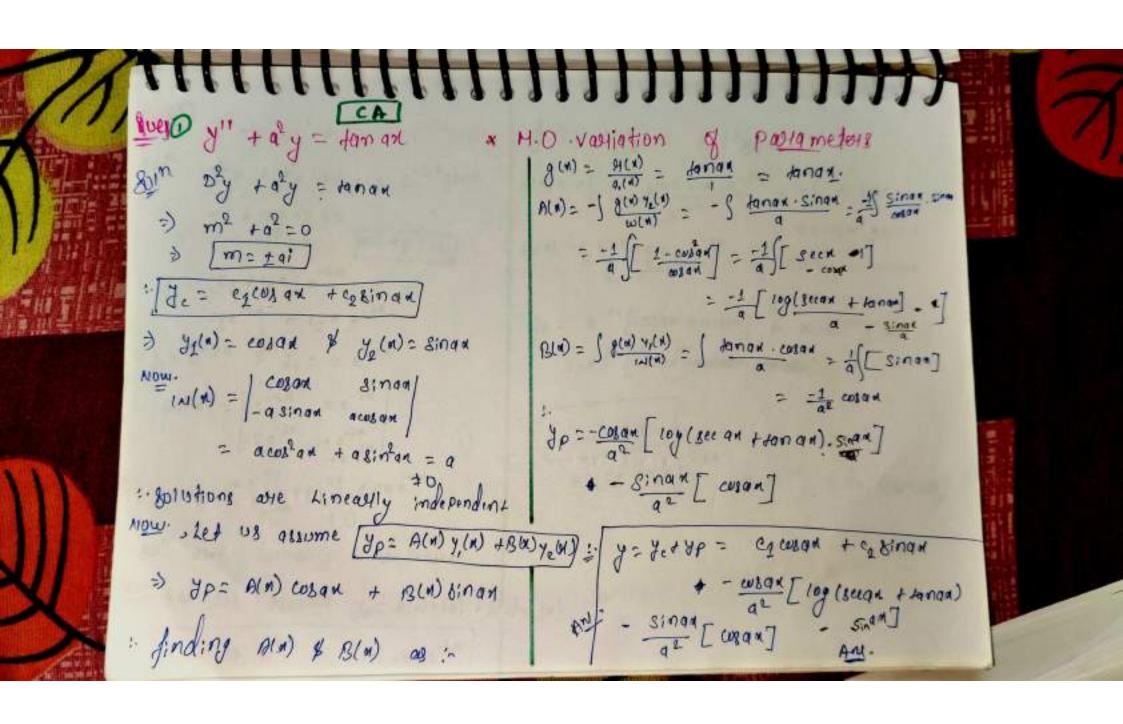
 S_{y}^{n} . Alc $y_{1}(x) = x$ & $y_{2}(x) = 1/x$ $B(x) = \int \frac{1}{4x} \cdot x dx = -\frac{1}{2} \int x dx$

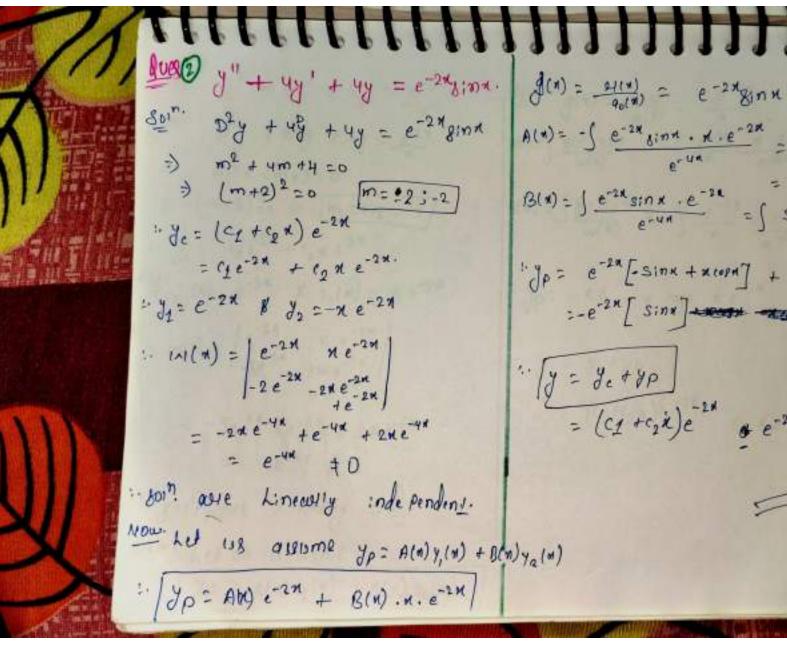
1. yp= = 10gx ·x + (-x2) -1

: G15 = Yet yp = e1x + c2 : 1 + 1 x logn

HHHHHHHHH)

Austions Practise.





$$\frac{\int_{0}^{1} dx}{\int_{0}^{1} dx} + uy' + uy = e^{-2x} \sin x$$

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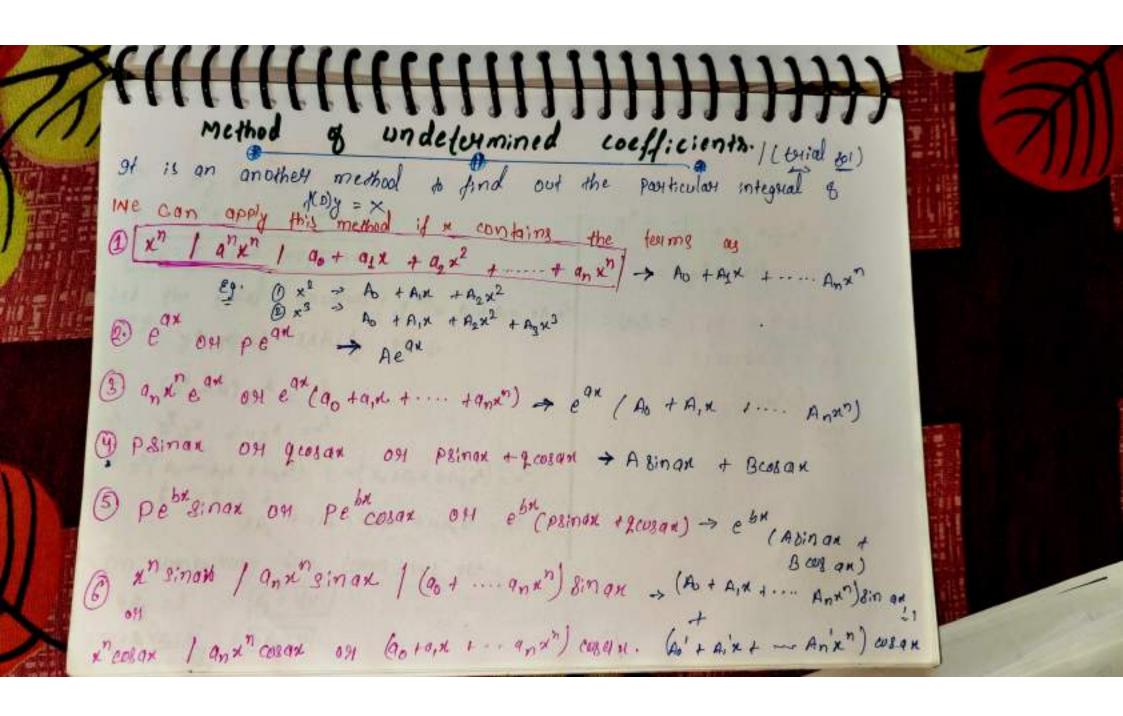
$$\frac{\int_{0}^{1} dx}{\int_{0}^{1} dx} + uy' = e^{-2x} \sin x$$

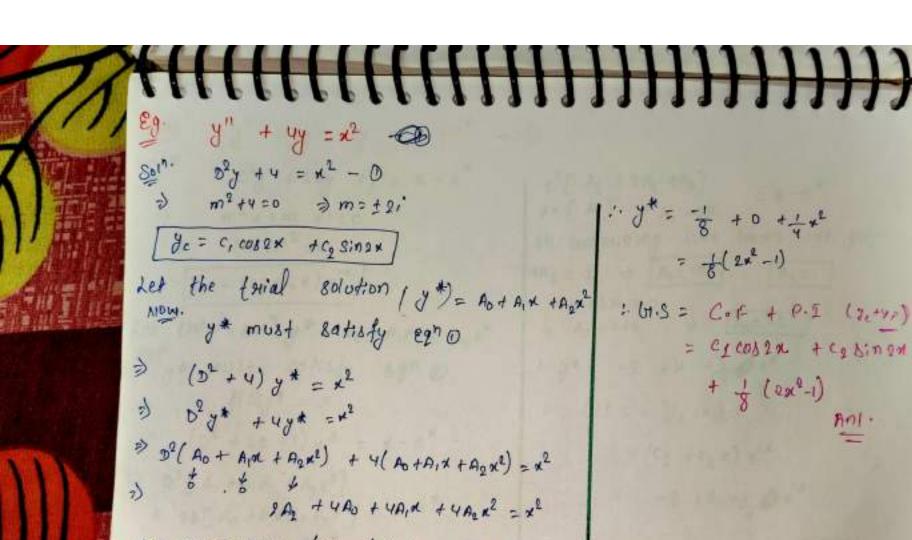
$$\frac{\int_{0}^{1} dx}{\int_{0}^$$

Avy 9" + 6y' + gy = e-3x Sun. Dy + 60y + 9y = e-2x => m2+6m+9=0 => (m+3)20 => [m, =m2=-3] 1. Ye = exe BX + C2x e 3x Ly y(n) = e-3x x y2(n) = x e-3x -- -3e-6x + e-6x + 3xe-6x - e-6x + 0 = goin core Lineally ind. NOW! Let us assisme Typ = A(N) Y1(N) +B(N) Yela)

$$\frac{Now.}{g(x)} = \frac{g(x)}{g(x)} = \frac{e^{-3x}}{x}$$

$$\frac{MN}{g(x)} = \frac{g(x) \cdot r_{x}(x)}{g(x)} = -\int \frac{e^{-3x}}{x} \cdot \frac{x \cdot e^{-3x}}{e^{-6x}} = -\int \frac{1}{x} \cdot \frac{e^{-3x}}{e^{-6x}} = -\int \frac{1}{x} \cdot \frac{e^{-3x}$$





on compaising like terms, we get

4Ag = 1 => [Az = 1/4]

2A2+A4A=0 1 4A,=0

100 y" + 2y' + y = x - cx - 0

Soin- D2y + 2 Dy +y = 1 - ex

s) m2 + 1 m + 1 = 0

 $3 \quad (m+1)^2 = 0$

: de = (c2 + c2 x) e-x)

Let third sol" y = A + A x + A e 2

Now y * must satisfy eqn 0

 $\Rightarrow f(0)y^* = x$

" (D2 + 20 +1) y* = x - ex

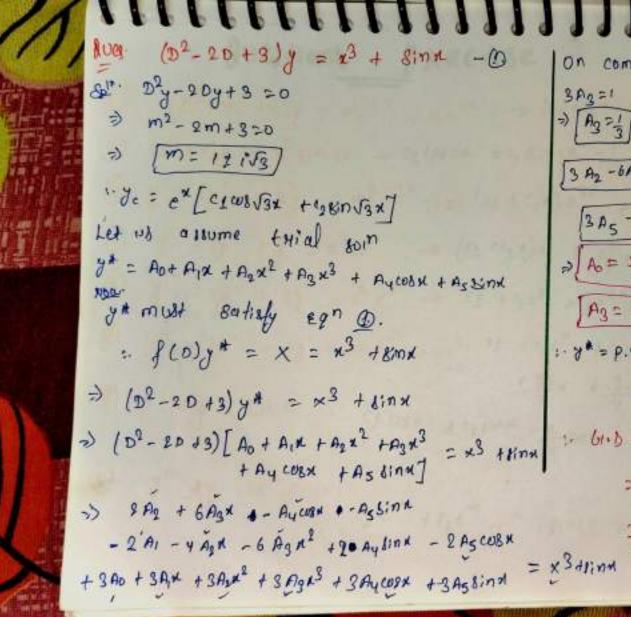
 $D^{2}[A_{0} + A_{1}R + A_{2}e^{X}]$ $+ 2D[A_{0} + A_{1}R + A_{2}e^{X}] = X - e^{X}$ $+ A_{0} + A_{1}X + A_{2}e^{R}$

=> Azex +2A1 + 2A2ex + A0 + A1x + A2ex = x -ex

 $e^{x}[A_{2} + 2A_{2} + A_{2}]$ = $x - e^{x}$ $+x[A_{1}] + A_{0} + 2A_{1}$ on compatiting like learns the get- $+A_{2} = -1 \Rightarrow A_{2} = -1/4$ $A_{1} = 1$ $+A_{2} = -1 \Rightarrow A_{2} = -1/4$ $A_{1} = 1$ $+A_{2} = -1 \Rightarrow A_{2} = -1/4$ $A_{3} = 1$ $+A_{3} = -1/4$ $+A_{4} = 0$ $+A_{5} = -1/4$ $+A_{5} = 0$ $+A_{$

-2 +x -10ex

An.



3A3=1 1 6A3 + 3A, -4A2 =0 =) [A3=1] [3 Ay -2 A5 - A4 = 0] 3 A2 -6A3=0 2 A2 - 2 A1 +8A5=0 (3A5 - A5 + 2Ay = 1) 2 Ao = -8 / A1 = 2 / [A2=2/3] [A3 = 118] Ay = A5 = 1/4 : y = p.2 = -8 + 2 x + 2 x + 1 x = 1 + 1 x = 1 +4 (sink + cost) 1. 61.0 = ye + 9p = ex[cycopysx + c28inv3x] -8 + 2x + 2x2 + \frac{1}{3}x2 + \frac{1}{3}x3 + + (find + cosm)

HHHHHHHHHH

Questions Practise

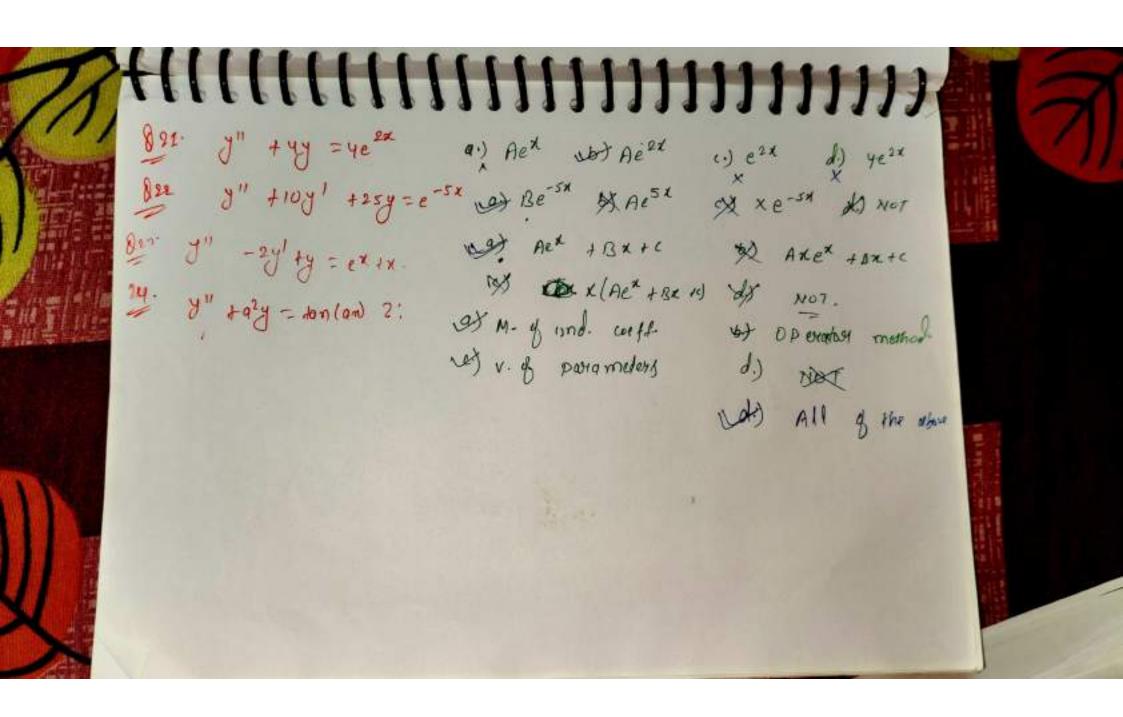
(2)
$$(D^2+4)y = x^2 \sin 2x \rightarrow c_1 \cos 2x + c_9 \sin 2x - \frac{1}{12} x^3 \cos 2x + \frac{1}{16} x^2 \sin 2x + \frac{1}{16} x^2 \sin 2x$$

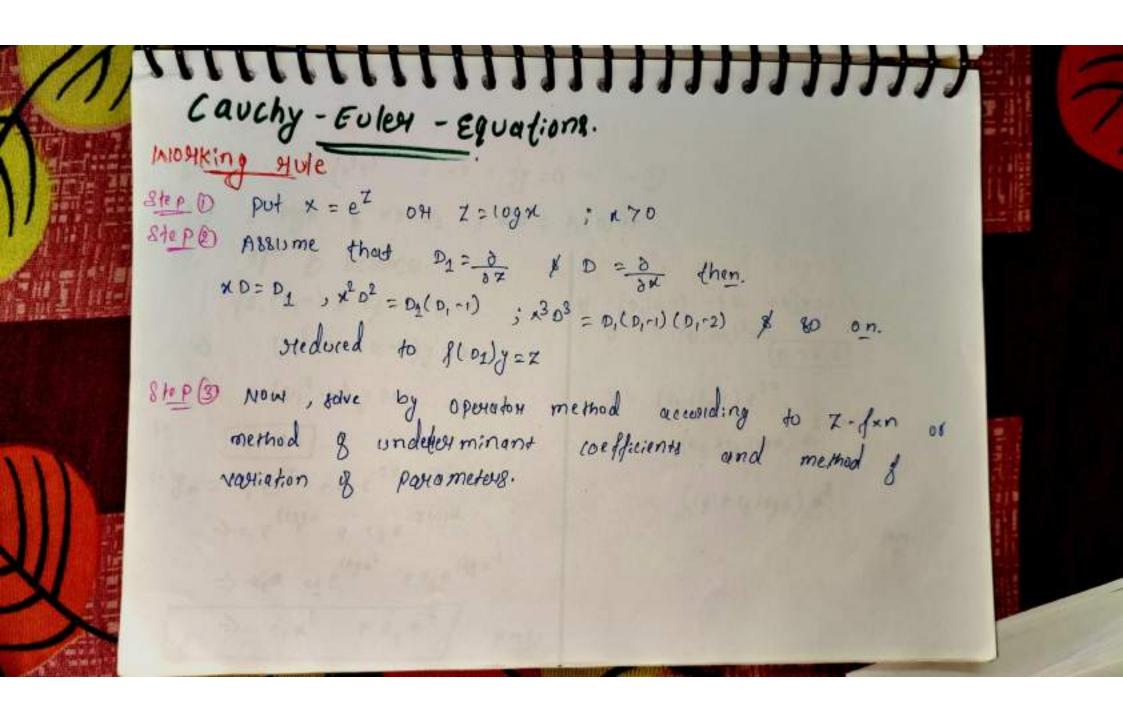
(3)
$$y'' - 6y' + 9y = x^2 e^{3x} \rightarrow (c_1 + c_2 x) e^{3x} + \frac{x^4}{12} e^{3x}$$

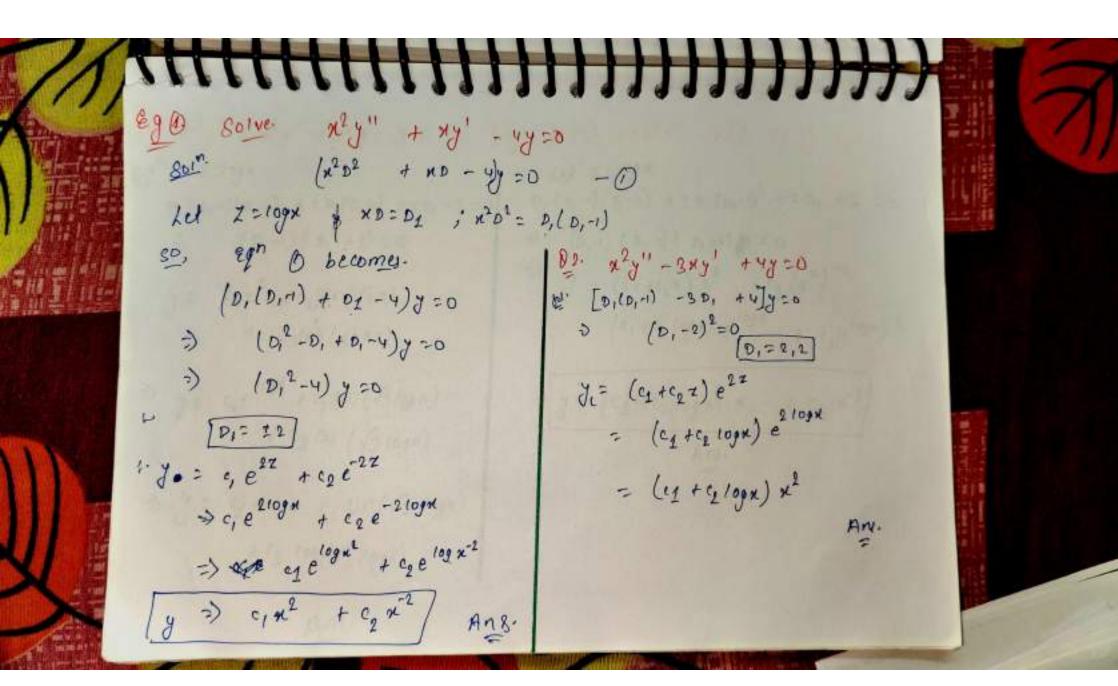
$$9"+y=sinx c1 cosx + cosinx - x cosx$$

(1)
$$y'' - yy = e^{x} \sin 2x$$

$$c_1 e^{x} + c_2 e^{-x} - e^{x} (\sin 2x + \cos 2x) / 8$$







them ((the them))))))))

183. x3y" + 9x2y" + 3xy -3y=0

D, (0,-1)(0,-2) +2 D, (0,-1) +20, -3=0

=) (D,-1)(D12+3)=0

d = c,e + c28in(v3z) + c3c08 (v3*z)

7) y= c,e 109x + c, 810 (83109x) + c3 cus (83109x)

) y = 4x + c2 8in (v3 10gm) + c3 cos (v3 10gm) 84. (x303 +3x202 -2x0 +2) 4 =0

 $D_1(D_1-1)(D_1-2) + 2D_1(D_1-1) - 2D_1 + 2 = 0$

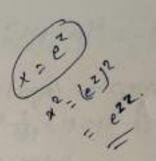
=> (0,-1) (0,-1) (0,+2) p=0

 $y = (c_1 + c_2 z) e^z + c_3 (e^z)^{-2}$ $= (c_1 + c_2 \log x) e^{\log x} + c_3 (e^{\log x})^{-2}$

=> y= (c1+c210gx) x + c3 x-2)
Ans.

Ang-

Ques x2j" +y = 3x2 D1(0,-1) +1 = 3x2 CF = e 7/2 [1 cos Z\s + cq sin Z\s] = e 109x12 [c1 (08 \square 109x + c2 8in \square 3 109x] $P.I: \frac{1}{D_1^{2}-D_1H} \stackrel{3}{=} \frac{e^{2z}}{4^{-2}H} = \frac{e^{2z}}{e^{2z}}$ $(D_1^{-32}) = \frac{1}{4^{-2}H} \stackrel{2z}{=} e^{2z}$ $= e^{2(09)} = \chi^{2}$ + y = e 10 p m/2 [4 cus 5 10g x + c281 n x 10g n 7 Ant.



1 x2y" + 2xy' = 10gx - C1 + C2 + 1 [19g (x)]2 - 10gx (2° 0° + 7x0 +13)y = 10gx x -3 [c4 (w) (2109x) + C2817 (2109x)] 3 x3y" + 3x2y" + xy' +y = 109 x +x = 12 [c2 cos (5 109x) + c38in (5 109x) $O(x^2 + 6^2 - 90 + 5)y = 8in(1094) x^2[c_1cos(1094) + c_2 8in(1094)] + x + 1094$ [[x2 02 - (2m-1) x 0 + (m2+n2)]y x [c, cos(nlogx) + c sin(nlogx)] + x [r, cos(nlogx) + c sin(nlogx)] + x m/opx (6) x2y"-2xy' +2y=x+x210gx+x3 + C1x+C2x2 - N10gx +x3 + (x2/2)[10gx)2 x2 02y -3x 0y +5y = 225mloga x2 c108logx + c25inlogx) -x2 logx collogx.

Queg. x2y" - 3xy' + 5y = 22 810/10gx) +x

Som Let x=e2 04 Z=10gx \$ xD=D1 ; x2D2=D,(D,-1)

: Egn D Belome.

: dc = elx [cacusz + ez sinz]

= x2 [c] (ws(10gn) + c25in 10g(n)7 3 2. e2 sinz + ez

: Jp = 1 [e12 8:00 + e27 0,2-40,+5

 $\frac{e^{12} \sin(\epsilon)}{p_1^2 - 4p_1 + 5} + \frac{1}{p_1^2 - 4p_1 + 5} e^{2}$

D > 0+0 > 0+2

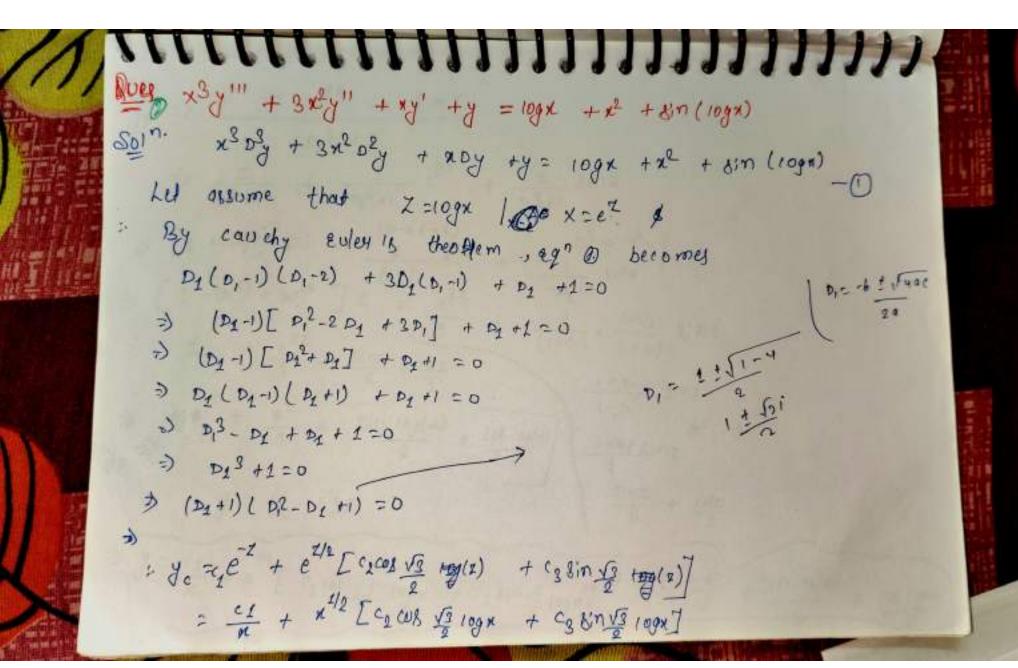
$$\frac{1}{(D_1+2)^2-4(D_1+2)+5} + \frac{1}{D_1^2-4D_1+5}$$

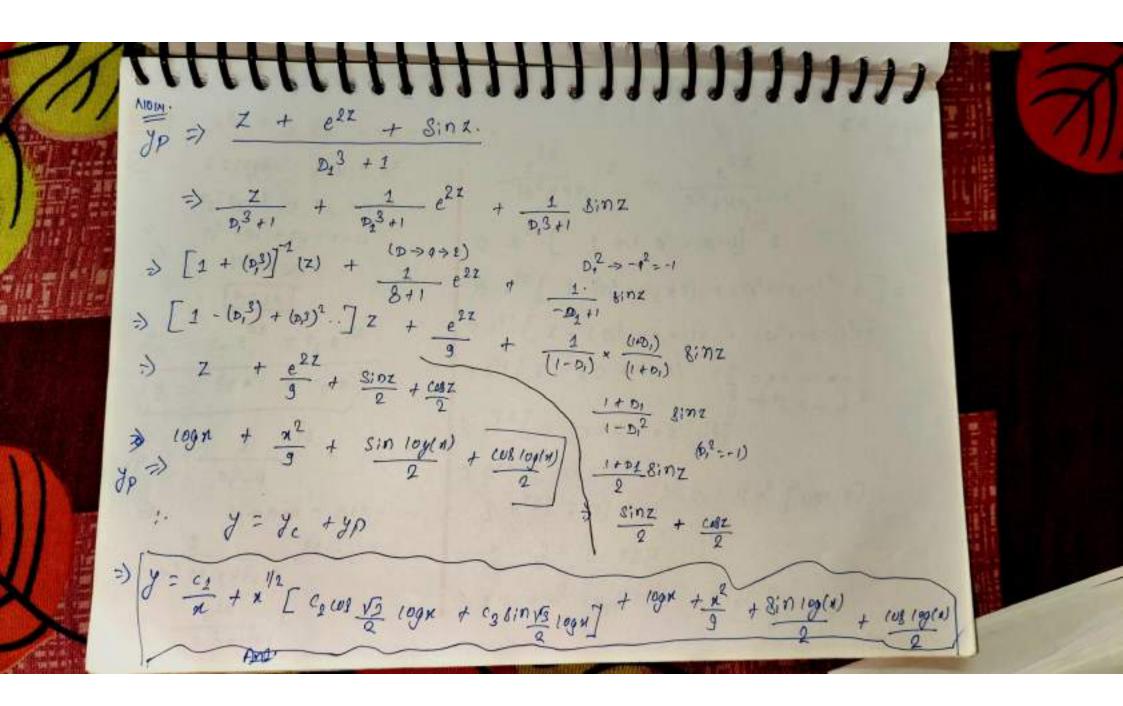
$$\frac{e^{2x}}{D_{1}^{2}+1} \frac{8in(x)}{D_{1}^{2}-a^{2}-1} + \frac{e^{x}}{2}$$

$$\frac{e^{2z}}{-1+1} \sin z + \frac{e^{z}}{2}$$

$$\frac{1}{2} - \frac{Z \cdot e^{2}t}{2} \cos z + \frac{e^{Z}}{2} \Rightarrow \frac{-109 \times . \times^{2} \cos(109 x)}{2} + \times 12$$

: Ty= gc + ya





MHHHHHHHHHH

204 x2y" + xy' - yy = x2 10g/s)

Soin Z=109x ; $x=e^{x}$

P1(D1-1) + D1 -4=0

=> P12 -D1 +D1 -4=0

Di-4=0

 $y_{e} = c_{1} e^{2Z} + c_{2} e^{-2Z}$

[ye = c1 x2 + c2 x2

 $J_{p} = \frac{1}{p_{x}^{2} - y} e^{2z} \cdot z$

D D D D 14 3 D 12

1 pit +4 +4D1-4 et . Z

=) ell . z

 $\frac{e^{2Z}}{D_{2}^{2}+V_{p_{1}}}\cdot Z \Rightarrow \frac{e^{2Z}}{D_{1}^{2}+V_{p_{1}}+1-1}\cdot Z$

⇒ e2z [1 + (42 + 49, -1)] -1 z

> e21 [1 - (0,2+401 €1) + (0,2+40,-1)2...] =

3 e 22 [Z - (0,1+40,+1) z + (0,2+40,-1)2]

> e22 [z - (0 + 4 - 2) + [0 + 0 + 1 + 7] 2

> e2 [z - 4 + z + z - 8]

=> e2x [37-12]

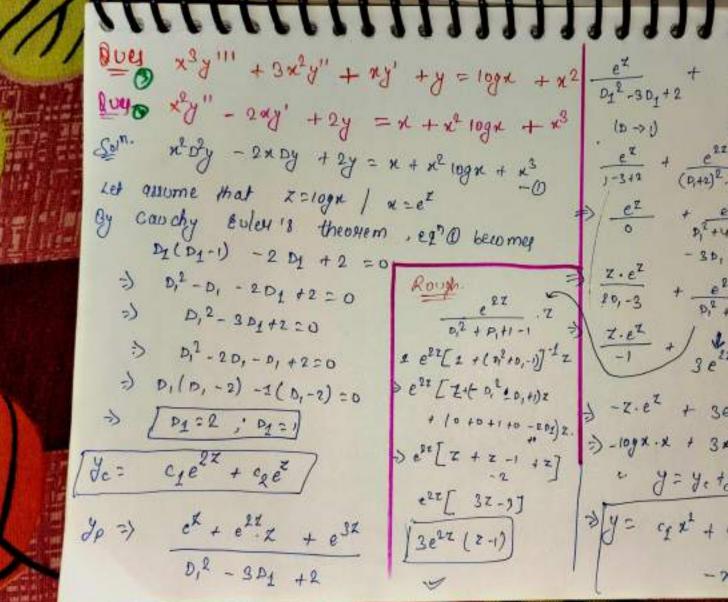
3 e 2 Z [Z - 4] + 31 -> 3 x = [109x - 4]

Am.

+ y = y = + yp

> y = c, x2 + cox 2 + 3x2 [logx -4]





$$\frac{e^{x}}{D_{1}^{2}-3D_{1}+2} + \frac{e^{2x}}{D_{1}^{2}-3D_{1}+2} + \frac{e^{3x}}{D_{1}^{2}-3D_{1}+2}$$

$$\frac{e^{x}}{(D\rightarrow 1)} + \frac{e^{2x}}{(D\rightarrow 2)} + \frac{e^{3x}}{(D\rightarrow 3)}$$

$$\frac{e^{x}}{(D\rightarrow 1)} + \frac{e^{2x}}{(D\rightarrow 2)} + \frac{e^{3x}}{(D\rightarrow 2)} + \frac{e^{3x}}{(D\rightarrow 3)}$$

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