

UNIT-II ORDINARY DIFFERENTIAL EQUATIONS

SNS COLLEGE OF TECHNOLOGY



Cauchy's Linear Differential Equation

(An Autonomous Institution) Coimbatore-641035.

J. Solve $x^2 y'' + 2xy' = 0$ Soln Gaven $(\pi^2 D^2 + \pi \pi D)y = 0 \longrightarrow (1)$ Take 2=02 z = log 2 x D = D' $a^{2} D^{2} = D' (D' - I) = D'^{2} - D'$ Subs. the above PD (1), JD2- D'+2D19= 0 $\int D'^2 + D J y = 0$ $m^2 + m = 0$ $D' \rightarrow m$ AE m(m+1) = 0m=0, m=-1CF = Aeox + Be- X = A + B e Z ... The soln. PS, y = cF = A + B e log x $\overrightarrow{R}. \text{ Solve } x^2 \frac{d^2 y}{dx^2} = 3x \frac{dy}{dx} + 4y = x SPD(log x).$ Given $(z^2 b^2 - 3z b + 4) y = z Sin(\log z)$ (1)801n. Take z=ez X = log x x D = D' $x^2 D^2 = D'(D' - I) = D'^2 - D'$ Subs. the above 9n(1) $\left[D^{\prime 2} - D^{\prime} - 3D^{\prime} + 4Jy = e^{\chi} SPn \chi\right]$ $\int D'^{2} - 4D' + 4] Y = e^{7} SPh Z$ $m^2 - 4m + 4 = 0$ AE $(m_{-2})^2 = 0$ m = 2, 2Scanned with CamScanner

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UNIT-II ORDINARY DIFFERENTIAL EQUATIONS

Cauchy's Linear Differential Equation

$$CF = (A + Bz) e^{az}$$

$$CF = [A + B \log x] z^{a}$$

$$PI = \frac{1}{b^{2} - Ab^{2} + 4} e^{z} Sn z$$

$$= e^{z} \frac{1}{(b^{2} + b^{2} - A(b^{2} + b) + A)} Sn z$$

$$= e^{z} \frac{1}{(b^{2} + b^{2} - A(b^{2} + b) + A)} = b^{2} + 1$$

$$= e^{z} \frac{1}{b^{2} - 2b^{2} + b} Sn z$$

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

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