

SNS COLLEGE OF TECHNOLOGY



(An Autonomous Institution)

DEPARTMENT OF MATHEMATICS

Method of variation of parameters:

The Second order linear differential equation is,

$$\frac{d^2y}{dx^2} + P \frac{dy}{dx} + Q y = R$$

Step 1: Find Complimentary function. From this calculate y , and y , (coefficient of constant).

Step 2: Find Wronskian.

$$W = \begin{vmatrix} y, & y_2 \\ y', & y'_2 \end{vmatrix} \neq 0$$

$$P \cdot T = Py + Q y$$
where $P = -\int \frac{R}{W} y_2 dx$

$$Q = \int \frac{R}{W} y_1 dx$$

The Second order linear differential equation is $Q = \frac{R}{R} y_1 dx$.

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DEPATMENT OF MATHEMATICS

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$$\frac{a}{dx^{2}} + 4y = casec \vec{x}$$

The A'E is

$$m^{2} + y = 0$$

$$m^{2} = -4$$

$$m = \pm 2i = 0 \pm 2i$$

$$\alpha = 0, \beta = 2$$

$$C.F = e^{\alpha x} (A \cos \beta x + B \sin \beta x)$$

$$= e^{0x} (A \cos \beta x + B \sin \beta x)$$

$$C.F = A \cos 2x + B \sin 2x$$

$$y_{1} = \cos 2x, y_{2} = \sin 2x$$

$$y'_{1} = -\sin 2x (2), y'_{2} = \cos 2x \cdot 2$$

$$= -a \sin 2x = 2 \cos 2x$$

$$W = \begin{vmatrix} y_{1} & y_{2} \\ y'_{1} & y'_{2} \end{vmatrix}$$

$$= \begin{vmatrix} \cos 2x & \sin 2x \\ -a \sin 2x & 2\cos 2x \end{vmatrix}$$

$$= a \cos^{2} 2x + a \sin^{2} 2x$$

$$= a (\cos^{2} 2x + \sin^{2} 2x)$$

$$W = a$$