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UAS MATEMATIKA II

1. $x'' + 4x' + 3x = 0$

$$(x + 1)(x + 3)$$

$$x = -1 \quad x = -3$$

Solusi umum

$$x = C_1 e^{-x} + C_2 e^{-3x}$$

2. $y'' - 6y' + 8y = 3 \cos x$

$$y_p = y = A \cos x + B \sin x$$

$$y' = -A \sin x + B \cos x$$

$$y'' = -A \cos x - B \sin x$$

$$-A \cos x - B \sin x - 6(-A \sin x + B \cos x) + 8(A \cos x + B \sin x) = 3 \cos x$$

$$(-A - 6B + 8A) \cos x + (-B + 6A + 8B) \sin x = 3 \cos$$

$$\left. \begin{array}{l} -A - 6B + 8A = 3 \\ 7A - 6B = 3 \\ -B + 6A + 8B = 0 \\ 6A + 7B = 0 \\ 6A = -7B \end{array} \right\} \begin{array}{l} A = 0,245 \\ B = -0,21 \end{array}$$

$$y_p = 0,245 \cos x - 0,21 \sin x$$

$$y_p = A \cos x + B \sin x$$

$$y_p = -0,245 \cos x + 0,21 \sin x$$

$$y = y_h + y_p$$

$$y = C_1 e^{2x} + C_2 e^{4x} - 0,245 \cos x + 0,21 \sin x$$

3. Solusi Persamaan diferensial $y^{(4)} + y''' - 7y'' - y' + 6y = 0$

$$r^4 + r^3 - 7r^2 - r + 6 = 0$$

$$1 \left| \begin{array}{cccc|c} 1 & 1 & -7 & -1 & 6 \\ & 1 & 2 & -5 & -6 \\ \hline 1 & 2 & -5 & -6 & 0 \end{array} \right. + r_1 = 1$$

$$-1 \left| \begin{array}{cccc|c} 1 & 2 & -5 & -6 \\ & -1 & -1 & 6 \\ \hline 1 & 2 & -5 & -6 & 0 \end{array} \right. + r_2 = -1$$

$$2 \left| \begin{array}{ccc|c} 1 & 1 & -6 \\ & 2 & 6 \\ \hline 1 & 3 & 0 \end{array} \right. + r_3 = 2$$

$$-3 \left| \begin{array}{cc|c} 1 & 3 \\ & -3 \\ \hline 1 & 0 \end{array} \right. + r_4 = -3$$

Solusi Persamaan :

$$y = C_1 e^t + C_2 e^{-t} + C_3 e^{2t} + C_4 e^{-3t}$$

4. Solusi dari Persamaan $y''' - 3y'' + 3y' - y = 4e^t$

$$\lambda^3 - 3\lambda^2 + 3\lambda - 1 = 0$$

$$(\lambda - 1)^3 = 0$$

$$\lambda_{1,2,3} = 1 \quad k=3$$

$$y_0 + i\beta = 0$$

$$y_0' = 0$$

$$y_0'' = 0$$

$$y_0''' = 0$$

$$-A = 4e^t$$

$$A = 4e^t \rightarrow A = -4e^t$$

$$y_0 = -4e^t$$

$$y = (C_2 x^2 + (1x + C_1)e^x - 4e^t$$