Rešiti

DN 68

$$y'' + 9y = \cos 2x$$

h.e.:

$$y'' + 9y = 0$$

$$\lambda^2 + 9 = 0$$

$$\lambda_{1,2} = \pm 3i$$

$$y_H = C_1 \cos 3x + C_2 \sin 3x$$

n.e.:

$$y'' + 9y = \cos 2x$$

$$f(x) = \cos 2x = e^{0x}(1 \cdot \cos 2x + 0 \cdot \sin 2x)$$

$\alpha = 0, \beta = 2 \qquad \alpha + i\beta = 0 + 2i$ ni koren k.e. $r = 0$

$m = n = 0 \Rightarrow N = 0$

$$y_P = A\cos 2x + B\sin 2x$$

$$y_P' = -2A\sin 2x + 2B\cos 2x$$

$$y_P'' = -4A\cos 2x - 4B\sin 2x$$

$$y'' + 9y = -4A\cos 2x - 4B\sin 2x + 9A\cos 2x + 9B\sin 2x$$

$$= 5A\cos 2x + 5B\sin 2x = \cos 2x$$

$$\Rightarrow 5A = 1 \Rightarrow A = \frac{1}{5}$$

$$5B = 0 \Rightarrow B = 0 \quad \Big\} \Rightarrow y_P = \frac{1}{5}\cos 2x$$

$$y_S = C_1 \cos 3x + C_2 \sin 3x + \frac{1}{5}\cos 2x$$