$\Delta < 0$

III $y'' + 2y' + 5y = 0$

$k^2 + 2k + 5 = 0$

$\Delta = 4 - 4 \cdot 5 = 4 - 20 = -15 = 15i^2$

$k_1 = \frac{-2 - \sqrt{15i^2}}{2} = \frac{-2 - \sqrt{15}i}{2}$

$k_2 = \frac{-2 + \sqrt{15i^2}}{2} = \frac{-2 + \sqrt{15}i}{2}$

$\alpha = -2$

$\beta = \sqrt{15}$

$y_1 = e^{\alpha x} \cos \beta x \qquad y_1 = e^{-2x} \cos \sqrt{15} x$

$y_2 = e^{\alpha x} \sin \beta x \qquad y_2 = e^{-2x} \sin \sqrt{15} x$

$y = C_1 e^{-2x} \cos \sqrt{15} x + C_2 e^{-2x} \sin \sqrt{15} x$