

Solutions to Linear Homogenous 2nd ODEs

Roots of the auxiliary equation	General Solution
Real, unequal ($r_1 \neq r_2$)	$c_1 e^{r_1 x} + c_2 e^{r_2 x}$
Real, equal ($r_1 = r_2 \equiv r$)	$c_1 e^{rx} + c_2 x e^{rx}$
Imaginary ($\alpha \pm i\beta$)	$e^{\alpha x} (c_1 \cos \beta x + c_2 \sin \beta x)$ OR $\mu e^{\alpha x} \sin(\beta x + \delta)$