Table of ansatzes for the method of undetermined coefficients

f	ansatz y_p
Polynomial $P_m(x) = a_0 + \ldots + a_m x^m$	Polynomial $x^s(A_0 + \ldots + A_m x^m)$
$a\cos kx + b\sin kx$ (one of a or b can be 0)	$x^s(A\cos kx + B\sin kx)$
$e^{rx}(a\cos kx + b\sin kx)$	$x^s e^{rx}(A\cos kx + B\sin kx)$
$P_m(x)e^{rx}$	$x^s(A_0 + \ldots + A_m x^m)e^{rx}$
$P_m(x)(a\cos kx + b\sin kx)$	$x^s\left[(A_0 + \ldots + A_m x^m)\cos kx + (B_0 + \ldots + B_m x^m)\sin kx\right]$
$P_m(x)e^{rx}(a\cos kx + b\sin kx)$	$x^s\left[(A_0 + \ldots + A_m x^m)e^{rx}\cos kx + (B_0 + \ldots + B_m x^m)e^{rx}\sin kx\right]$

Table of solutions to $\boldsymbol{X'} = A\boldsymbol{X} \in \mathbb{R}^2$

Eigenvalues of A	General solution $\boldsymbol{X}$
$\lambda_1, \lambda_2 \in \mathbb{R}$, $\lambda_1 \neq \lambda_2$	$c_1 e^{\lambda_1 t}\boldsymbol{v}_1 + c_2 e^{\lambda_2 t}\boldsymbol{v}_2$
$\lambda_1, \lambda_2 \in \mathbb{R}, \lambda_1 = \lambda_2$	$\begin{cases} c_1 e^{\lambda t}\boldsymbol{v}_1 + c_2 t e^{\lambda t}\boldsymbol{v}_2, & \text{if } \boldsymbol{v}_1, \boldsymbol{v}_2 \text{ are linearly independent} \\ c_1 e^{\lambda t}\boldsymbol{v} + c_2(t e^{\lambda t}\boldsymbol{v} + e^{\lambda t}\boldsymbol{w}), & \boldsymbol{w} \text{ is a generalized eigenvector associated to } \boldsymbol{v} \end{cases}$
$\lambda = \alpha + i\beta$ ($\beta \neq 0$) $\boldsymbol{p} = \boldsymbol{B}_1 + i\boldsymbol{B}_2$	$c_1 e^{\alpha t}\left[\cos(\beta t)\boldsymbol{B}_1 - \sin(\beta t)\boldsymbol{B}_2\right] + c_2 e^{\alpha t}\left[\cos(\beta t)\boldsymbol{B}_2 + \sin(\beta t)\boldsymbol{B}_1\right]$ or $c_1\mathrm{Re}(e^{\lambda t}\boldsymbol{p}) + c_2\mathrm{Im}(e^{\lambda t}\boldsymbol{p})$