<u>UNDETERMINED COEFFICIENTS</u> - **Can use only if** $\boxed{ay'' + by' + cy = g(t)}$ <u>AND</u> $g(t)$ is:

$\boldsymbol{g(t)}$	Form of $\boldsymbol{y_p(t)}$
$P_m(t) = a_0 t^m + a_1 t^{m-1} + \cdots + a_m$	$t^s \left[A_0 t^m + A_1 t^{m-1} + \cdots + A_m \right]$ $s = \#$ times $\boxed{\boldsymbol{r = 0}}$ is a char. root
$e^{\alpha t}\, P_m(t)$	$t^s \left[e^{\alpha t} \left(A_0 t^m + A_1 t^{m-1} + \cdots + A_m \right) \right]$ $s = \#$ times $\boxed{\boldsymbol{r = \alpha}}$ is a char. root
$e^{\alpha t}\, P_m(t)\, \cos \beta t$ <u>or</u> $e^{\alpha t}\, P_m(t)\, \sin \beta t$	$t^s \left[e^{\alpha t} \left\{ F_m(t)\, \cos \beta t + G_m(t)\, \sin \beta t \right\} \right]$ ($F_m(t)$, $G_m(t)$ are polynomials of degree m) $s = \#$ times $\boxed{\boldsymbol{r = \alpha + i\beta}}$ is a char. root

<u>*Characteristic Equation*</u>: $ar^2 + br + c = 0$

Alternatively, $s =$ the <u>smallest</u> integer ($s = 0, 1$ or 2) such that no term of $y_p(t)$ is a solution of the homogeneous equation. In other words, no term of $y_p(t)$ is a term of $y_c(t)$.