A small translated portion from the "Formulaire et tables":

Linear 2nd order differential equations with constant coefficients:

An equation of the type: $ay'' + by' + cy = g(x)$ with $a \neq 0$

Case where $g(x) = 0$

The general solution depends on the *characteristic equation*: $ar^2 + br + c = 0$

If this equations has…	The solution to the differential eq. is…
2 real solutions r_1 and r_2	$y = c_1 e^{r_1 x} + c_2 e^{r_2 x}$
1 real solution r	$y = (c_1 x + c_2) e^{rx}$
2 complex solutions $p \pm q\ i$	$y = e^{px}[c_1 \cos(qx) + c_2 \sin(qx)]$