

# Method of Undetermined Coefficients

*Inhomogeneous equation:*

$$a_0y + a_1y' + a_2y'' + a_3y^{(3)} + \dots + a_ny^{(n)} = q$$

where  $q \neq 0$ .

First solve the homogeneous equation, then guess a particular solution with a few undetermined coefficients:

For $q =:$	guess $y_p =:$
$e^{\alpha x}$	$Ce^{\alpha x}$
$e^{\lambda x}$	$Cx^n e^{\lambda x}$
$\cos x$	$C_1 \cos x + C_2 \sin x$
polynomial	polynomial
...	...

The general solution is any particular solution plus the general solution of the homogeneous equation.