

Undetermined Coefficients

Mathematics

The trial form to guess for each kind of forcing term.

For $ay'' + by' + cy = f(x)$, guess the shape of f .

Forcing term $f(x)$	Trial particular integral
A constant k	A
Polynomial of degree n	A full polynomial of degree n
$e^{(kx)}$	$A e^{(kx)}$
$\sin \omega x$ or $\cos \omega x$	$A \cos \omega x + B \sin \omega x$
$e^{(kx)} \sin \omega x$	$e^{(kx)}(A \cos \omega x + B \sin \omega x)$
Trial duplicates a CF term	Multiply the whole trial by x

If the trial already solves the homogeneous equation, multiply it by x — and by x^2 again if it still does. Then match coefficients.