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### 0.1 Linear second-order Ordinary Differential Equations

These are of the form

$$\frac{d^2y}{dt^2} + p(t)\frac{dy}{dt} + q(t)y = g(t)$$

There are two types. Homogenous equations are where  $g(t) = 0$ . Otherwise they are heterogenous.

We explore the case with constants:

$$a\frac{d^2y}{dt^2} + b\frac{dy}{dt} + cy = 0$$