homogeneous linear differential equation

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The linear differential equation

$$a_n(x)y^{(n)} + a_{n-1}(x)y^{(n-1)} + \ldots + a_1(x)y' + a_0(x)y \;=\; b(x) \qquad (1)$$

is called `http://planetmath.org/HomogeneousLinearDifferentialEquation`*homogeneous*
iff $b(x) \equiv 0$. If $b(x) \not\equiv 0$, the equation (1) is *inhomogeneous*.
If (1) is `http://planetmath.org/HomogeneousLinearDifferentialEquation`homogeneous,
then the sum of any solutions is a solution and any solution multiplied by a
constant is a solution.

The special case

$$c_n x^n y^{(n)} + c_{n-1} x^{n-1} y^{(n-1)} + \ldots + c_1 x y' + c_0 y \;=\; 0$$

of (1), where the c_i's are constants, can via the substitution $x = e^t$ be trans-
formed into a homogeneous linear differential equation of the same order but
with constant coefficients.