Is this all there is to it?

If the solutions of the characteristic equation are real and distinct, then yes.

Let n = order of differential equation = degree of characteristic equation.

A degree n polynomial equation such as

$$a_n r^n + a_{n-1} r^{n-1} + \cdots + a_1 r + a_0 = 0$$

has n solutions $r_1, \ldots, r_n$ which may be complex $(a+bi)$ and which may be repeated such that the polynomial factors as

$$a_n (r - r_1)(r - r_2)(r - r_3) \cdots (r - r_n)$$

Theorem

If the characteristic equation has n solutions $r_1, r_2, \ldots, r_n$ that are all distinct and real, then the general solution is

$$y(x) = c_1 e^{r_1 x} + c_2 e^{r_2 x} + \cdots + c_n e^{r_n x}$$

Fact: for $r_1, r_2, \ldots, r_n$ distinct, the functions $e^{r_1 x}, e^{r_2 x}, \ldots, e^{r_n x}$ are linearly independent

[Follows from the relation between the discriminant and the Vandermonde determinant, if you care.]