1. **Motivation** From e^x, we find $(e^x)' = e^x$. Immediately the question arises: Is e^x unique for $f'(x) = f(x)$? How about the case $f'(x) = \alpha f(x)$?

2. **Solution** By Taylor Expansion, we find analytic solutions $c_0 \cdot e^{\alpha x}$ and by assumption that $f(x)$>0 we get the same solutions.

3. **Generalization** We then hope to solve $y' + p(x)y = q(x)$. We perform multiplication of the function $\varphi(x)$, getting its general form. Substituting $-\alpha$ and 0 for $p(x)$ and $q(x)$ resp. , we entirely solve (1).

4. **Second − ordered** The equation $y" + (\alpha + \beta)y' + \alpha\beta \cdot y = 0$ can be solved by means of two-variable simultaneous equations, and that of solving first-order equations twice.

5. **Multiple − Root** Solution to $y" + 2r \cdot y' + r^2 y = 0$ is $y = c_0 \cdot e^{-rx} + c_1 \cdot xe^{-rx}$.

6. **Imaginary − Roots** Two particular roots $y_1 = \sin ax$, $y_2 = \cos ax$ would lead to the general solution $y = c_1 \sin ax + c_2 \cos ax$.

7. **Generalization** By use of "translation" like that performed on graphs on $\mathbb{R}^2$, the form is $y = e^{\rho x}(c_1 \sin \omega x + c_2 \cos \omega x)$. Also, we might apply theories of complex variables, and imitate previous methods. The solution set remains the same.