$$
\begin{aligned}
\frac{1}{C}\int i \cdot \mathrm{d}t + L \cdot \frac{\mathrm{d}i}{\mathrm{d}t} + R \cdot i &= 0 \quad | \text{Differentiation} \\
\frac{1}{C} \cdot i + L \cdot \frac{\mathrm{d}^2 i}{\mathrm{d}t^2} + R \cdot \frac{\mathrm{d}i}{\mathrm{d}t} &= 0 \quad | : L \text{ und sortieren} \\
\frac{\mathrm{d}^2 i}{\mathrm{d}t^2} + \frac{R}{L} \cdot \frac{\mathrm{d}i}{\mathrm{d}t} + \frac{1}{LC} \cdot i &= 0 \quad \left| \; \frac{R}{L} = \delta;\ \frac{1}{LC} = \omega_0^2 \right. \\
\ddot{i} + \delta \dot{i} + \omega_0^2 i &= 0
\end{aligned}
\tag{9.18}
$$