$$\underline{Z}_1 = R_1 + \mathrm{j}\cdot\omega\cdot L$$

$$\varphi_1 = \arg(\underline{Z}_1) = \operatorname{atan}\left(\overbrace{\frac{\omega\cdot L}{R_1}}^{q_1}\right)$$

$$\varphi_1 = 2\cdot\varphi_2$$

$$\underbrace{\tan(\varphi_1)}_{q_1} = \underbrace{\tan(2\cdot\varphi_2)}_{\frac{\overbrace{2\cdot\tan(\varphi_2)}^{q_2}}{1-\underbrace{\tan^2(\varphi_2)}_{q_2^2}}}$$

$$\rightarrow \quad q_2 = \sqrt{\frac{1}{q_1^{\,2}} + 1} - \frac{1}{q_1}$$

$$\underline{Z}_2 = R_1 + \frac{1}{\frac{1}{R_2} + \frac{1}{\mathrm{j}\cdot\omega\cdot L}}$$

$$\varphi_2 = \arg(\underline{Z}_2) = \operatorname{atan}\left(\underbrace{\frac{1}{\frac{\omega\cdot L}{R_2} + \frac{R_1}{R_2}\cdot\left(\frac{R_2}{\omega\cdot L} + \frac{\omega\cdot L}{R_2}\right)}}_{q_2}\right)$$

$$\rightarrow \quad R_2 = \frac{\frac{1}{2}\cdot\omega\cdot L + \sqrt{\left(\frac{1}{2}\cdot\omega\cdot L\right)^2 + R_1\cdot\left(\frac{\omega\cdot L}{q_2} - R_1\right)}}{\frac{1}{q_2} - \frac{R_1}{\omega\cdot L}}$$