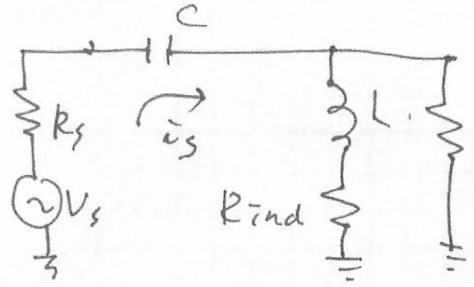

Under matched conditions,

$$i_S = \frac{V_s}{2R_s}.$$

1) $$i_{RL} = \frac{V_s}{2R_s} \cdot \frac{SL + R_{ind}}{SL + R_{ind} + R_L}$$

$$V_{RL} = i_{RL} \cdot R_L$$

$$\therefore P_{RL} = Re\left(V_{RL} \cdot i_{RL}^*\right) = R_L \cdot i_{RL} \cdot i_{RL}^*$$

$$= \frac{V_s^2}{4R_s^2} \cdot R_L \frac{R_{ind}^2 + \omega_0^2 L^2}{(R_L + R_{ind})^2 + \omega_0^2 L^2}$$

$$= \frac{V_s^2}{4R_s} \cdot \frac{R_L}{R_s} \frac{\left(R_{ind}/R_L\right)^2 + \left(\omega_0 L/R_L\right)^2}{\left(1 + \frac{R_{ind}}{R_L}\right)^2 + \left(\frac{\omega_0 L}{R_L}\right)^2}$$

$$\frac{R_L}{R_s} = Q_T^2 + 1$$

$$\frac{\omega_0 L}{R_L} = \frac{1}{Q_T}$$

$$\frac{R_{ind}}{R_L} = \frac{1}{Q_T \cdot Q_{ind}}$$

apply

$$= \frac{V_s^2}{4R_s}\left(Q_T^2 + 1\right) \frac{\left(\frac{1}{Q_T \cdot Q_{ind}}\right)^2 + \left(\frac{1}{Q_T}\right)^2}{\left(1 + \frac{1}{Q_T \cdot Q_{ind}}\right)^2 + \left(\frac{1}{Q_T}\right)^2}$$

$$= \frac{V_s^2}{4R_s}\left(Q_T^2 + 1\right) \frac{1 + Q_{ind}^2}{\left(1 + Q_T \cdot Q_{ind}\right)^2 + Q_{ind}^2}$$