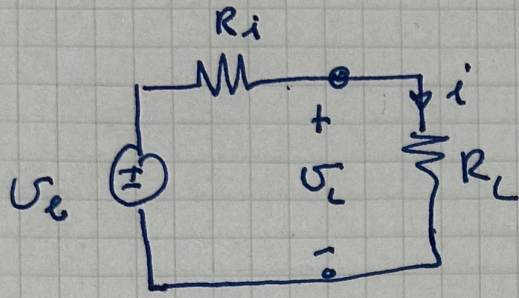


Efficiency versus Maximum Power Tr.



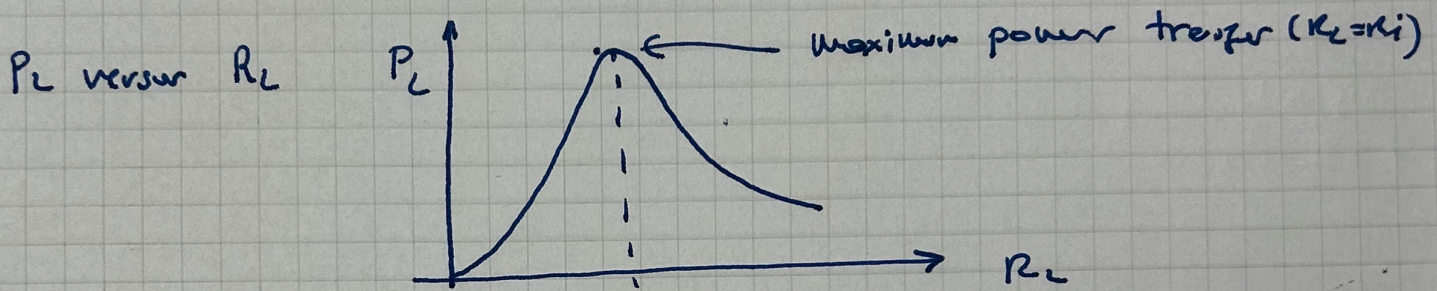
$$i = \frac{U_e}{R_i + R_L}$$

$$U_L = \frac{R_L}{R_i + R_L} \cdot U_e$$

$$P_L = \frac{1}{2} \cdot \frac{R_L}{(R_i + R_L)^2} \cdot U_e^2$$

$$P_e = \frac{1}{2} \cdot \frac{U_e^2}{R_i + R_L}$$

(Efficiency) $\eta = \frac{P_L}{P_e} = \frac{R_L}{R_i + R_L}$



Example $U_e = 150V$ and $R_i = 50\Omega$

	$R_L = 25\Omega$	$R_L = 50\Omega$	$R_L = 100\Omega$	$R_L = 250\Omega$
i	2A	1.5A	1A	0.5A
U_i	100V	75V	50V	25V
U_L	50	75V	100V	125V
P_e	150W	112.5W	75W	37.5W
P_i	180W	56.25W	25W	6.125W
P_L	50W	56.25W	50W	31.125W
η	$\frac{1}{3}$	$\frac{4}{5}$	$\frac{2}{3}$	$\frac{2.5}{3}$

maximum

high efficiency

but not max

POWER

with high efficiency we lose less power on the source!!