Last Lecture → Thevenin & Norton

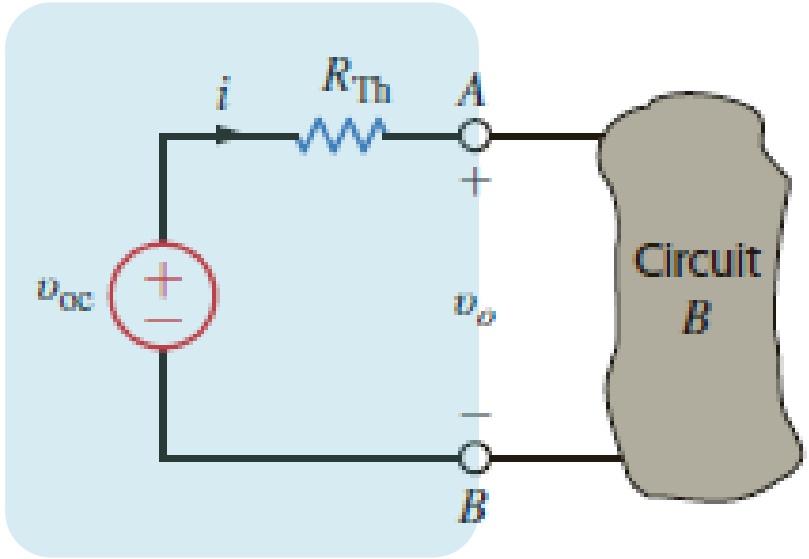
10/2/2019

1) **Independent Sources Only**
   - **Find either V_{oc} or I_{sc}**
   - **R_{Th} can be extrapolated directedly from the network**
2) **Dependent Sources Only**
   - **The equivalent circuit is R_{Th} only**
   - **Find R_{th} through ohms law by placing an voltage/current source and measuring the current/voltage**
3) **Independent and Dependent Sources**
   - **Must calculate both the V_{OC} and I_{SC} to calculate R_{TH}.**
   - **Must not split the dependent source an its controlling variable**

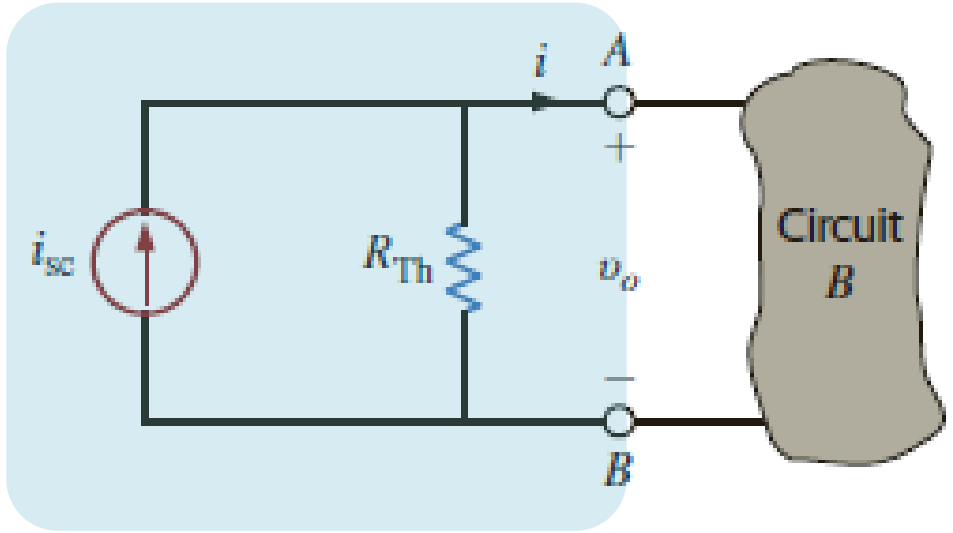
Last Lecture → Source Transformation

10/2/2019

- **Thevenin**



- **Norton**



Thevenin and Norton Equivalent circuits are equivalent…

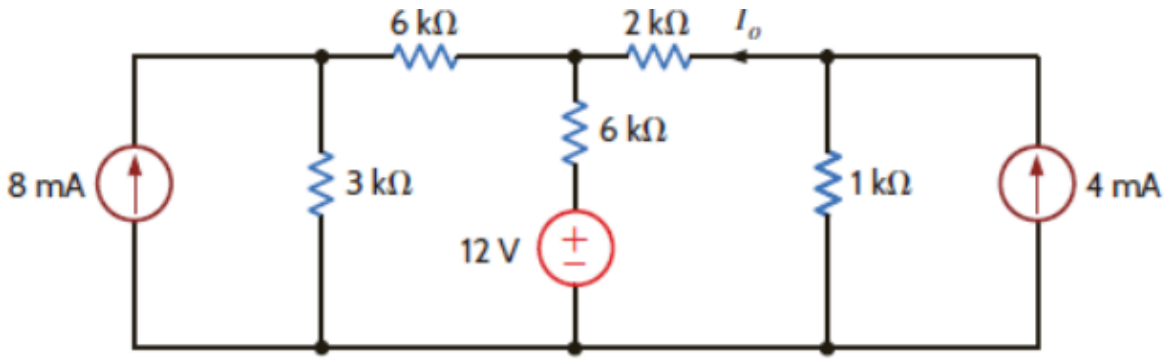
… hence source transformation is possible remembering

$$v_{oc} = R_{Th} \cdot i_{sc}$$

Learning Assessment → E5.15

10/2/2019

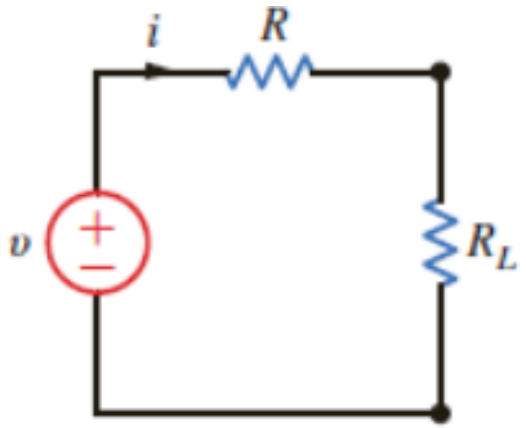
For the given network find I_0 using source transformation.

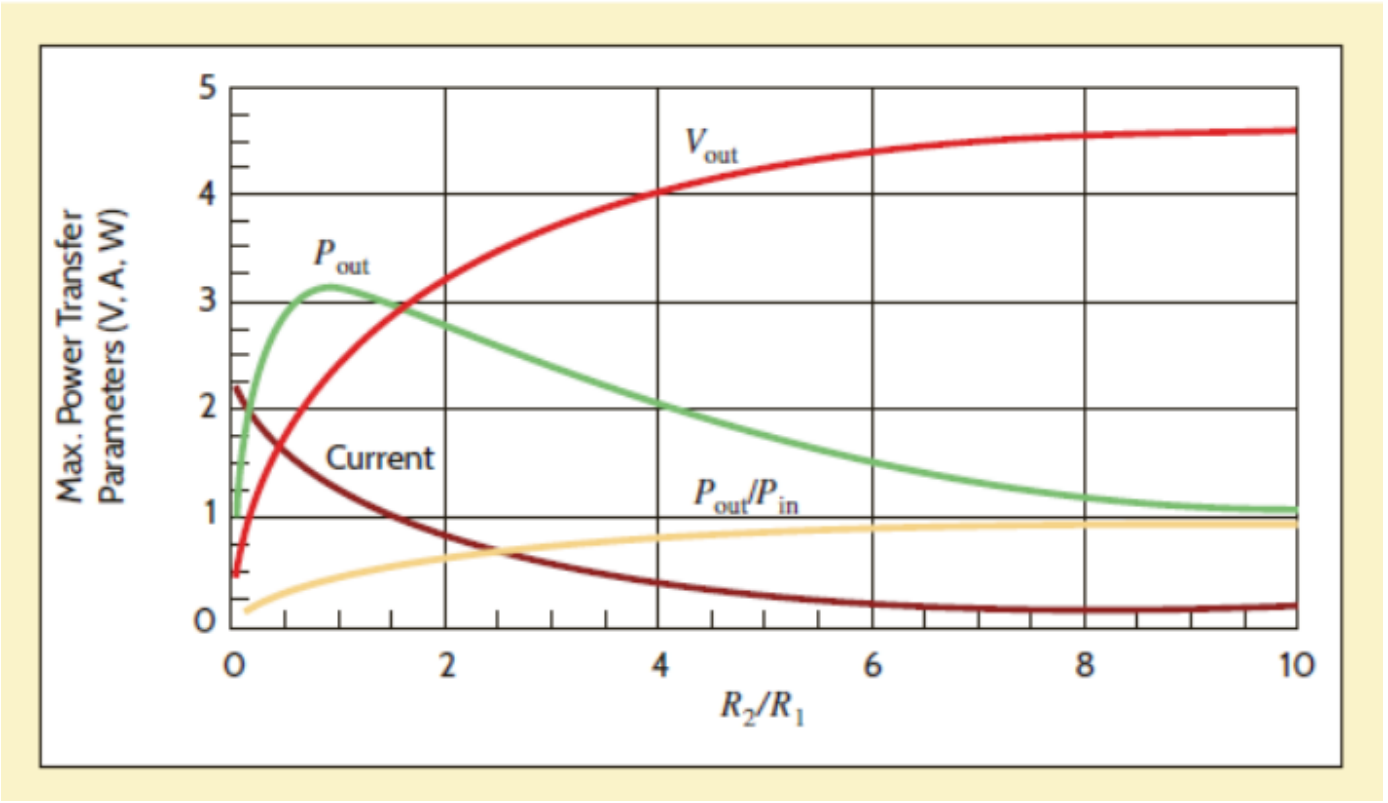


Maximum Power Transfer

10/2/2019

Determine the value of R_L such that maximum power is transferred from the source to the load.





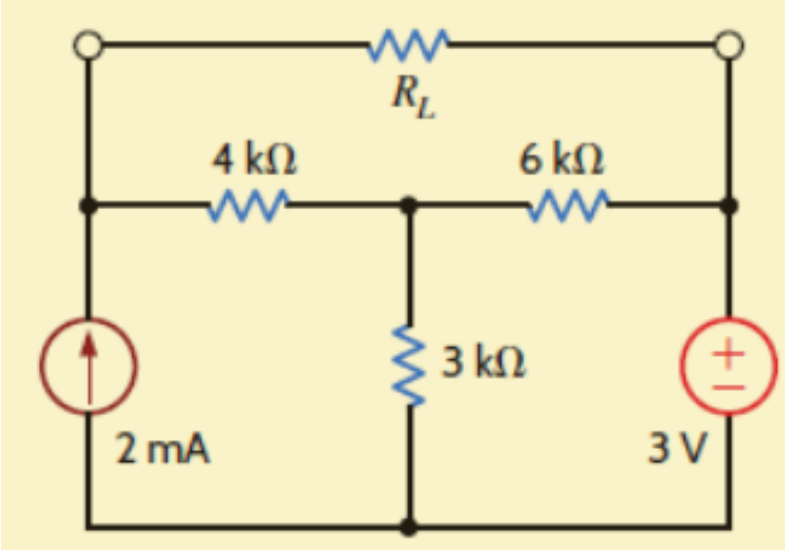
$$P_L = \frac{V_L^2}{R_L} = R_L\left[\frac{v}{(R_L+R)}\right]^2$$

$$\frac{\delta P_L}{\delta R_L} = \left[\frac{v}{(R_L+R)}\right]^2 - 2\cdot R_L\left[\frac{v}{(R_L+R)}\right]^2\frac{1}{R_L+R} \Rightarrow \frac{\delta P_L}{\delta R_L} = 0 \rightarrow R_L = R$$

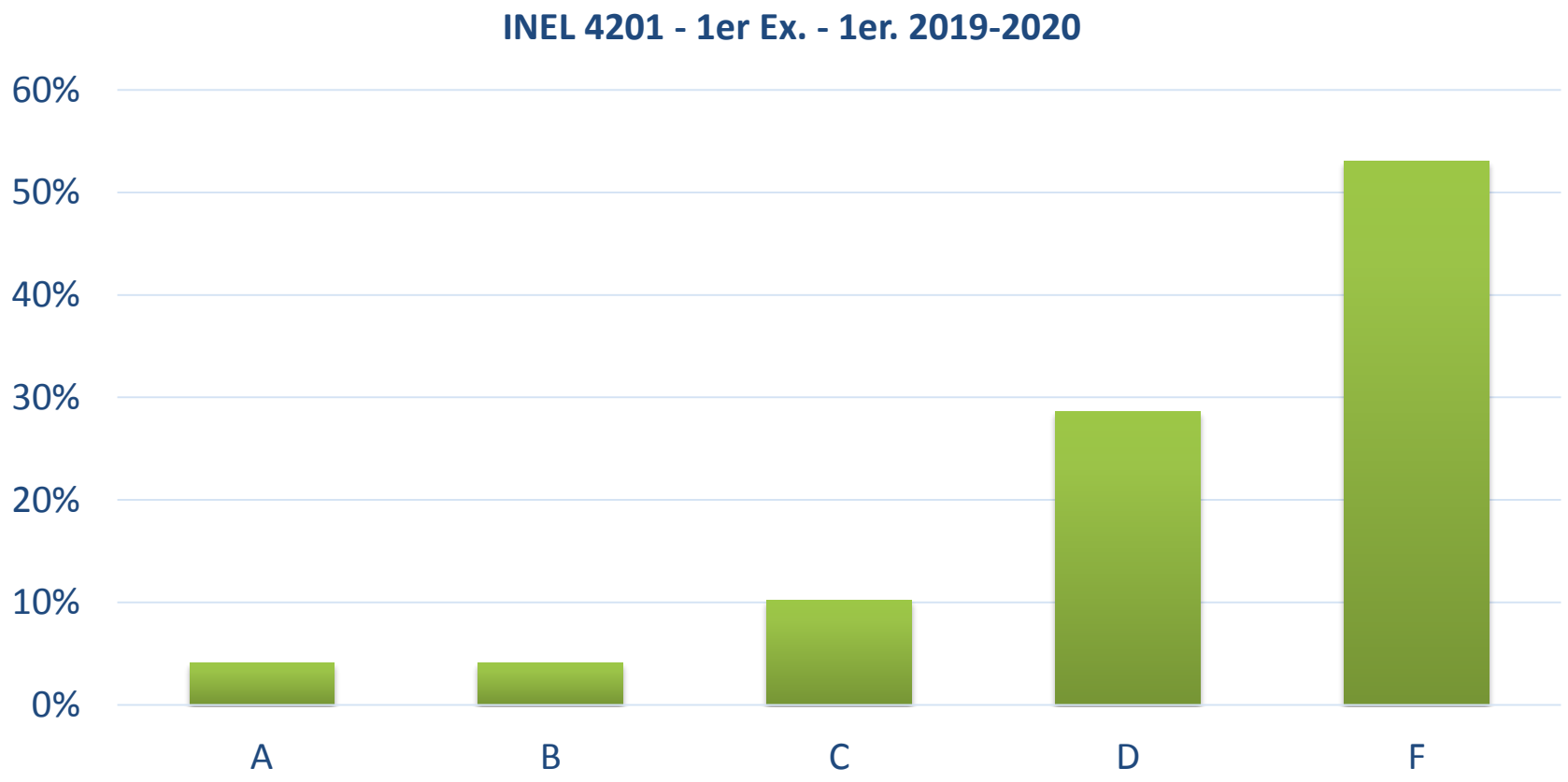
$$\eta = \frac{P_L}{P_{source}} = \frac{R_L}{R_L+R}$$

Example → 5.15

For the given network find the value of R_L for maximum power transfer and the maximum power that can be transferred to this load.



Exam #1 → Grade Distribution



49 Students

A – 2
B – 2
C – 5