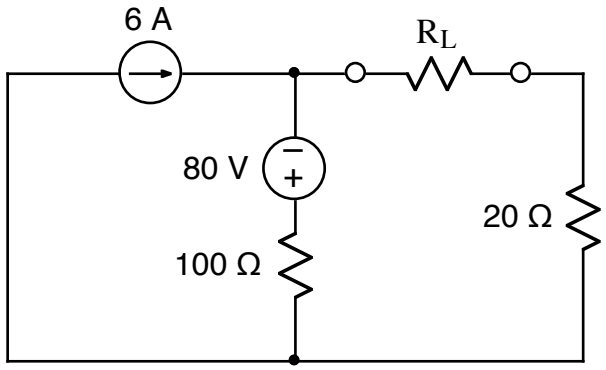
EX:

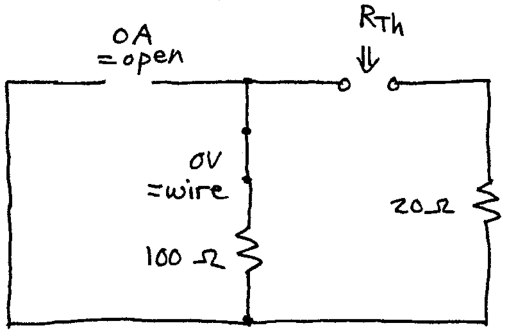


a) Calculate the value of R_L that would absorb maximum power.

b) Calculate that value of maximum power R_L could absorb.

Sol'n: a) $R_L = R_{Thev}$ for max pwr

Turn off sources, remove R_L, and look into circuit from R_L terminals to find R_{Th}.



$R_{Th} = 100\Omega + 20\Omega = 120\Omega$

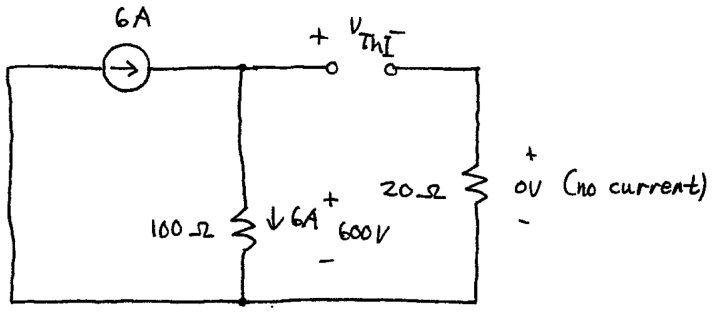
$\therefore R_L = 120\Omega$

b) max pwr $= \dfrac{\left(\frac{V_{Th}}{2}\right)^2}{R_{Th}}$ from Thev equiv with $R_L = R_{Th}$. (R_L sees $V = \frac{V_{Th}}{2}$.)

V_{Th} = V across R_L terminal with R_L removed.

Use superposition to find V_{Th}.

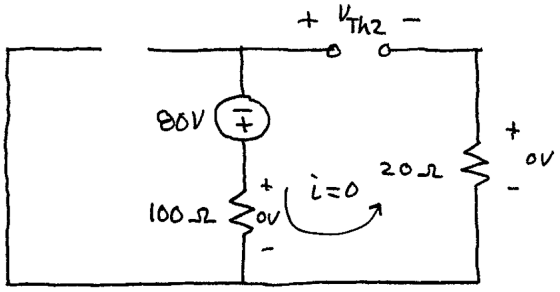
case I: 6A on, 80V off



V_{Th1} = V across 100Ω resistor = 6A · 100Ω

$\therefore V_{Th1} = 600V$

case II: 6A off, 80V on



We have no current no V drop across R's. The 80V appears as $-V_{Th2}$ across the terminals. $V_{Th2} = -80V$.

$V_{Th} = V_{Th1} + V_{Th} = 600 - 80\ V = 520V$

$P_{max} = \left(\frac{520}{2}\right)^2 / R_{Th} = \left(\frac{520}{2}\right)^2 / 120\Omega = \frac{1690}{3} W = 563.3W$