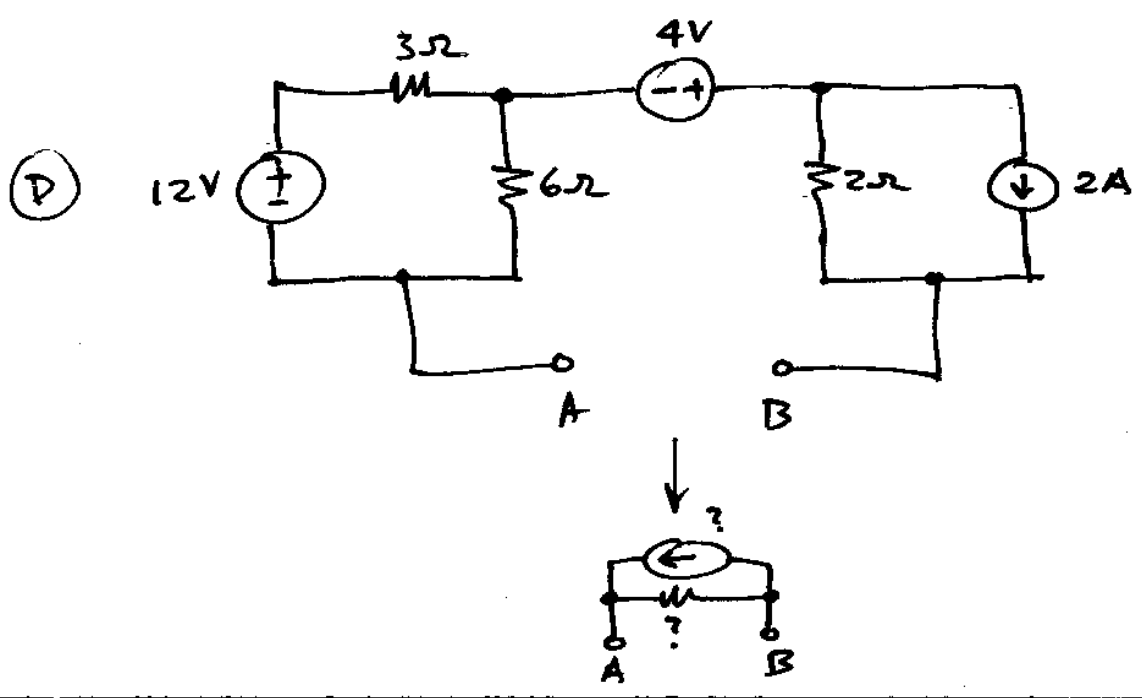
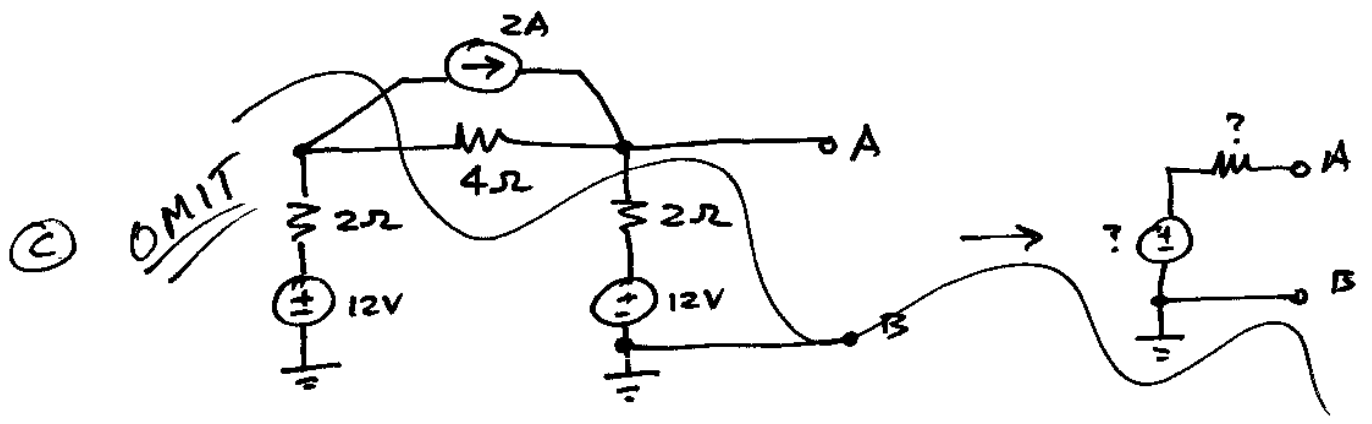
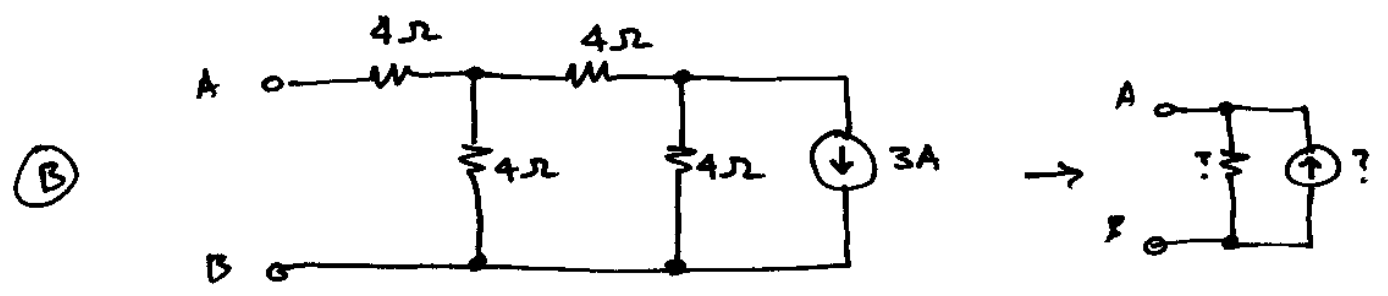
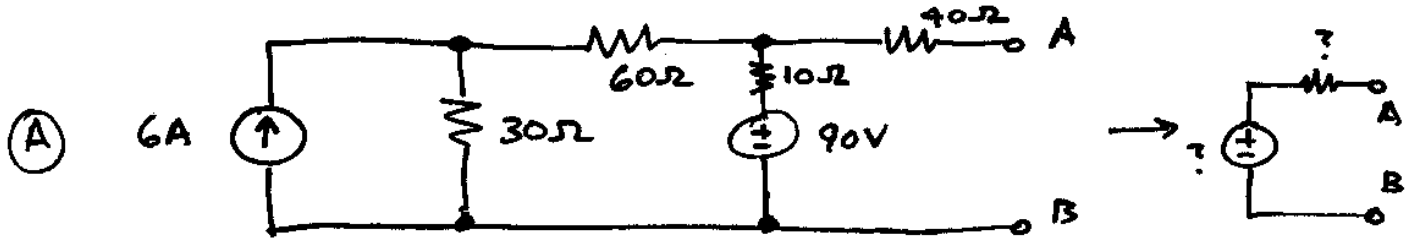


# SOURCE TRANSFORMATION PROBLEMS



## THEVENIN & NORTON EQUIVALENT PROBLEMS

Analyze the circuits on the previous page to find the Thevenin & Norton equivalent circuits. Find the lookback resistance first, then find  $V_{oc}$  ( $=V_T$ ) &  $I_{sc}$  ( $=I_N$ ).

## MATCHING PROBLEMS

Analyze the circuits on the previous page to find the following:

- maximum available power from each circuit
- load resistance that will maximize the power transferred from the circuit.
- load resistance(s) that will draw one quarter of the maximum available power from the circuit.

## ANSWERS

	(A)	(B)	(D)
* Source transformations:	99V, 49Ω	-0.6A, 6.67Ω	-4A, 4Ω
* Thevenin / Norton:	$V_T = 99V$ $R_T = 49\Omega$ $I_N = 2.02A$ $R_N = 49\Omega$	$V_T = -4V$ $R_T = 6.67\Omega$ $I_N = -0.6A$ $R_N = 6.67\Omega$	$V_T = -16V$ $R_T = 4\Omega$ $I_N = -4A$ $R_N = 4\Omega$
* Matching:			
- max power:	50W	600mW	16W
- load resistance for max:	49Ω	6.67Ω	4Ω
- load resistance for $\frac{1}{4}$ max power			

~~general eqn. can be found as  $8.58 R_T$  &  $5.42 R_T$~~   
 ~~$\left(\frac{14 \pm \sqrt{10^4}}{2}\right) R_T$~~   
 → you can derive the general equation as  

$$R_L = R_T \left( \frac{14 \pm \sqrt{192}}{2} \right)$$

$$= R_T(71.8E-3) \text{ \& } R_T(13.9)$$