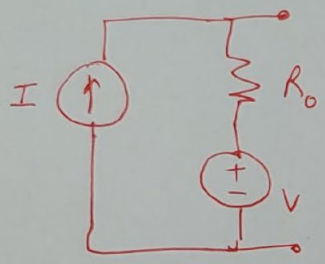
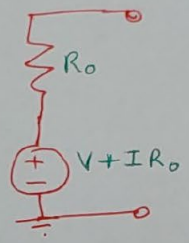
Q3

Solution.

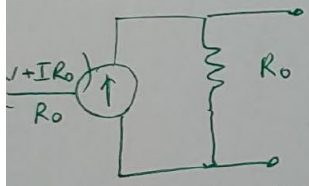
It helps to find the Thevenin & Norton Equivalents for a solar cell



Solar Cell

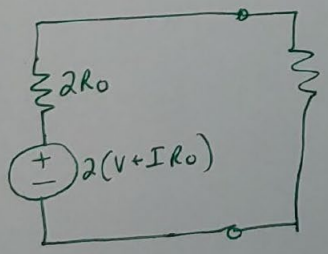


Thevenin Eq. (use superposition



Norton Equivalent

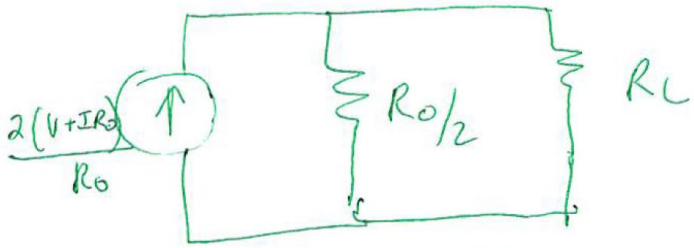
(a) Combine 2 cells in series (use Thevenin Eqs) and add to voltage across R_L



$$= 2(V+IR_o)\left(\frac{R_L}{R_L+2R_o}\right)$$

$$= \frac{2(V+IR_o)R_L}{(R_L+2R_o)}$$

(b) Combine 2 cells in parallel. (use Norton eq)



current through R_L

$$= \frac{2(V+IR_0)}{R_0}\left(\frac{R_0/2}{R_0/2+R_L}\right)$$

$$= \frac{2(V+IR_0)}{\cancel{R_0}}\left(\frac{\cancel{R_0}}{R_0+2R_L}\right)$$

$$= \frac{2(V+IR_0)}{R_0+2R_L}$$