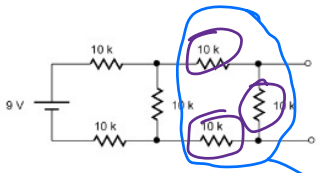
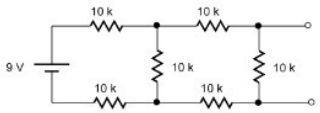
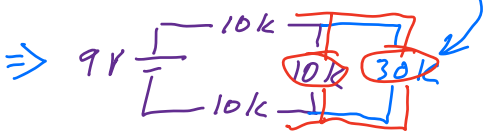
Find V_{th} and R_{th}:



1.) First find V_{th} with no output load



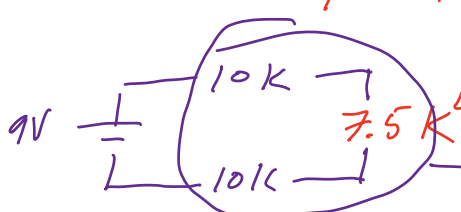
a.) These 3 are in series



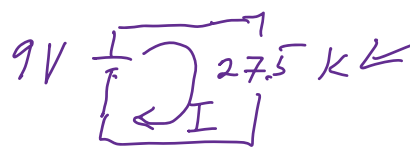
$$R_{eff} = \frac{1}{\frac{1}{10k} + \frac{1}{30k}} = \frac{10k \cdot 30k}{10k + 30k}$$

$$= \frac{300\ k}{40} = 7.5k\ \Omega$$

b.) These 2 in parallel



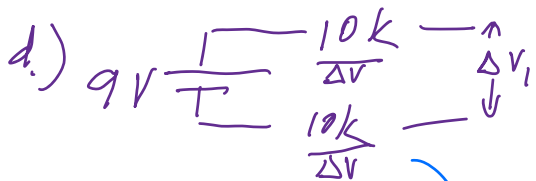
c.) 3 resistors in series



$\Rightarrow$ current from battery is

$$I = \frac{V}{R} = \frac{9V}{27.5k} = .33\ mA$$

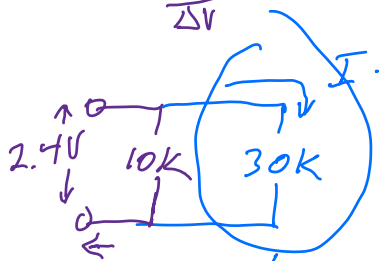
d.)



$$\Delta V = .33mA \cdot 10k = 3.3V$$

$$\Delta V_1 = 9V - 3.3 - 3.3 = 2.4V$$

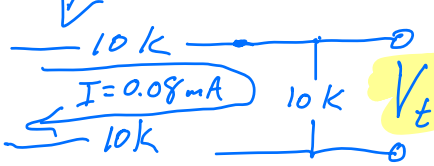
e.)



$I \cdot 30k = 2.4V$

$$\Rightarrow I = \frac{2.4V}{30k} = 0.08\ mA$$

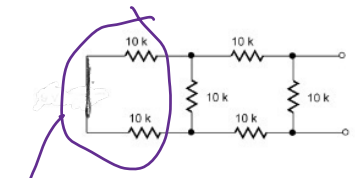
f)



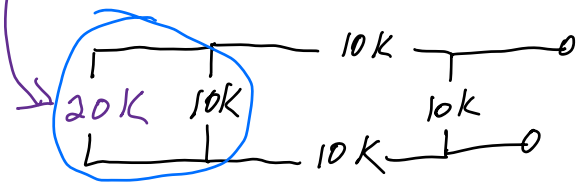
$= 0.08mA \cdot 10k$

$= 0.8V$

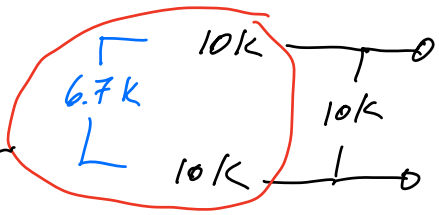
2.) Find R_{th} : Replace Voltages with wire:



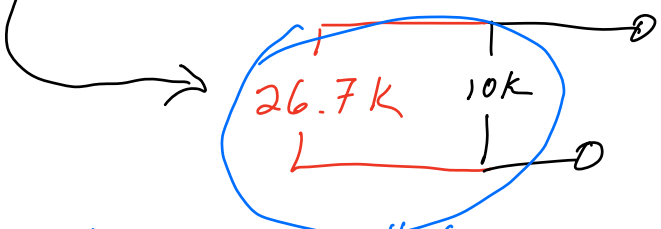
a) 2 10k resistors in series



b) $20k \parallel 10k \quad R_{eff} = \frac{20k \cdot 10k}{30k} = \frac{2}{3} \cdot 10k = 6.7k$



c) 3 in series



d.) 2 in parallel $\quad 26.7k \parallel 10k$

$$R_{eff} = R_{th} = \frac{26.7k \cdot 10k}{26.7k + 10k}$$

$$= 7.3k$$

Thevenin - equivalent circuit is: