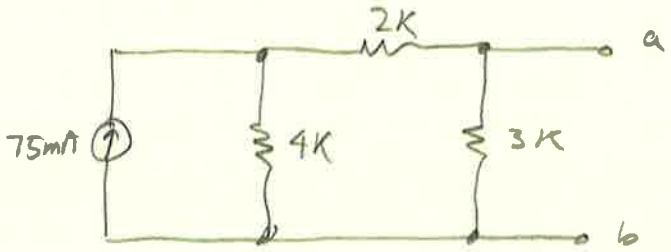
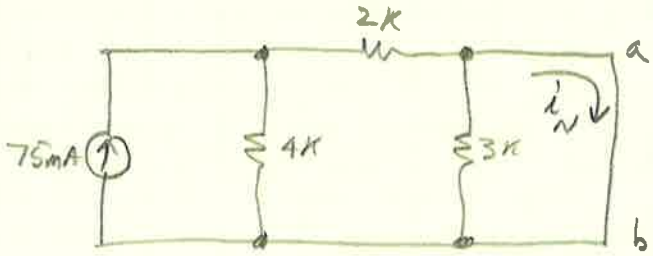
Find the Norton equivalent at a-b.

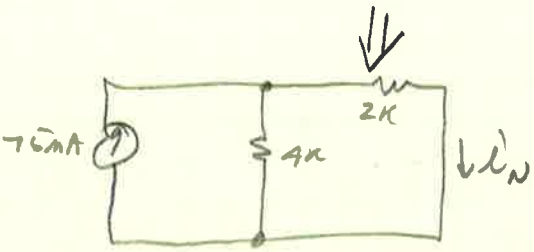


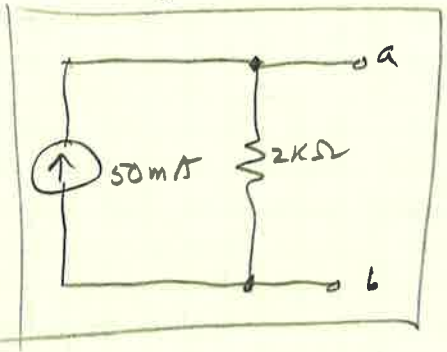
$$R_{Norton} = \frac{(3K)(6K)}{3K+6K} = \underline{\underline{2K\Omega}}$$



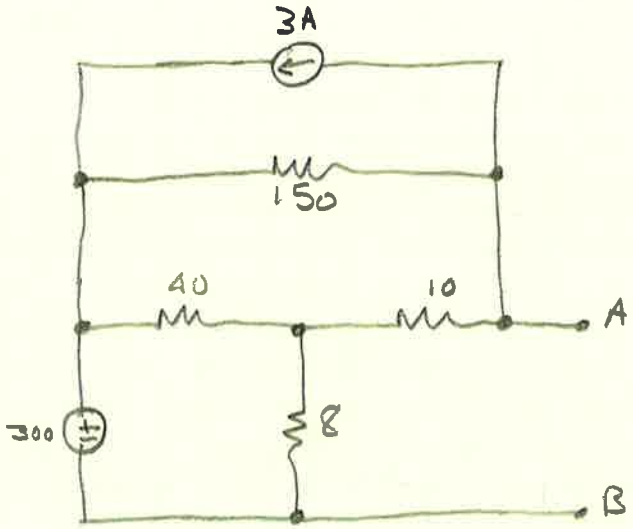
$$i_N = \frac{75mA\,(4K)}{4K+2K} = 50mA$$

the Norton equivalent is shown Below.





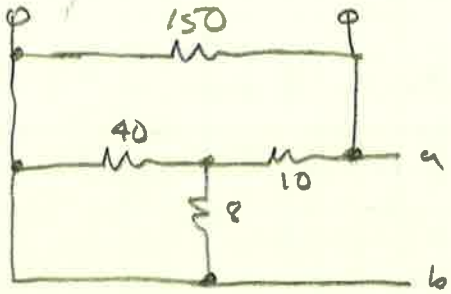
Find the thevenin equivalent at a-b.



1) Find R_{th}

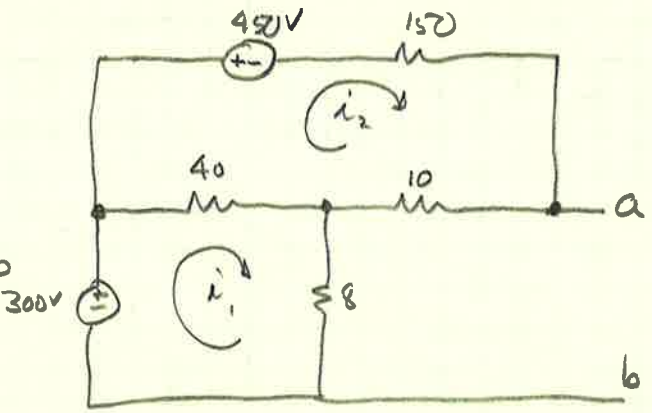
$R_{th} = (40 \| 8 + 10) \| 150$

$\boxed{R_{th} = 15\,\Omega}$



2) Find V_{th}

Do a source transformation
write mesh equations



mesh i_1

$-300 + 40(i_1 - i_2) + 8i_1 = 0$

mesh i_2

$450 + 150i_2 + 10i_2 + 40(i_2 - i_1) = 0$

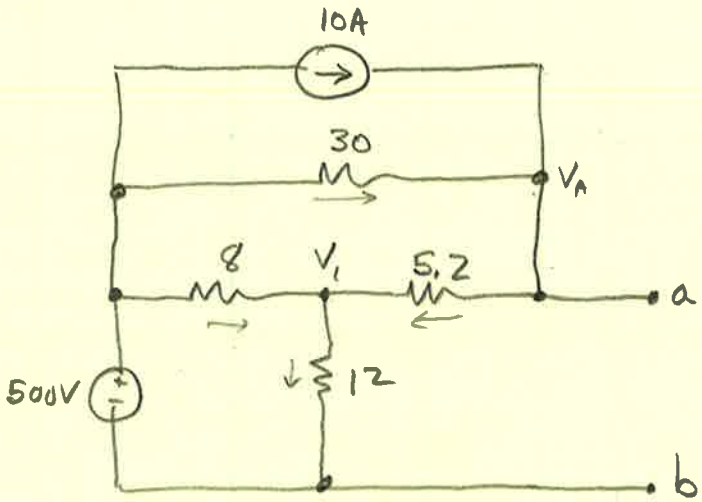
Solving

$i_1 = 5.25A$
$i_2 = -1.2A$

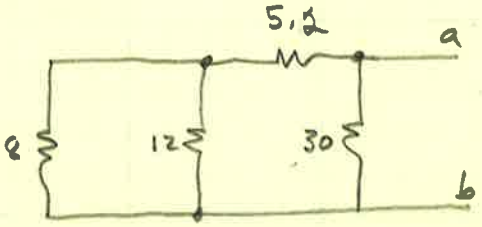
$V_A = V_{th} = 300 - 450 + i_2(150)$

$\boxed{V_{th} = 30\,V}$

Find Thevenin equivalent at terminals a-b.



Find R_{th}: $i \rightarrow$ open
$V \rightarrow$ short



$$R_{th} = [(8 \| 12) + 5.2] \| 30$$
$$= \boxed{7.5\,\Omega}$$

Find V_{th}:

Node V_A: $\sum i_{in} = \sum i_{out}$

$$10 + \frac{500 - V_A}{30} = \frac{V_A - V_1}{5.2}$$

Node V_1: $\frac{500 - V_1}{8} + \frac{V_A - V_1}{5.2} = \frac{V_1}{12}$

$$\boxed{V_A = V_{th} = 425V}$$

$$V_1 = 360V$$