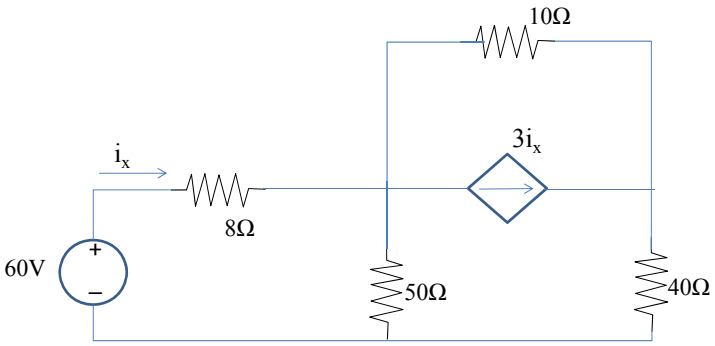
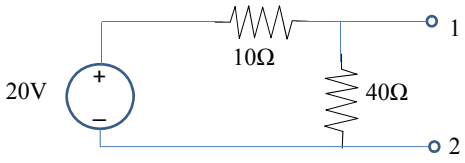
Problem 1

Use source transformation to find i_x in the circuit. (I_x=3.33A)



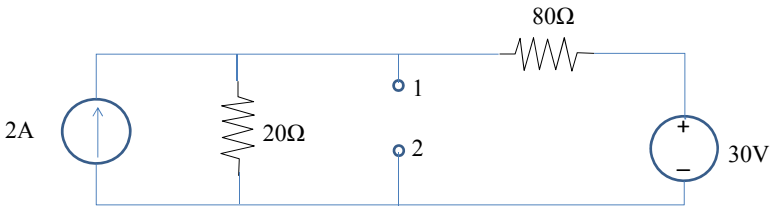
Problem 2

Determine R_{TH} and V_{TH} at terminals 1-2 of each circuit.



(a)

Answer: (a) V_{TH} =16V, R_{TH} = 8Ω



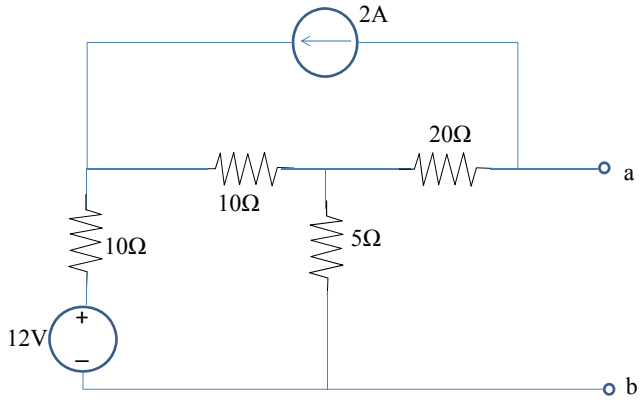
(b)

Answer: (b) V_{TH} = 38V, R_{TH} = 16Ω

Problem 3

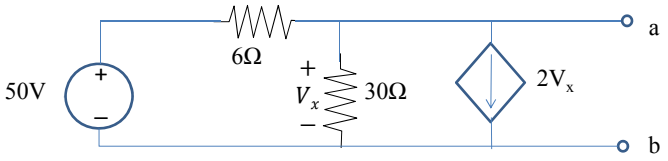
Obtain the Thevenin equivalent at terminals a-b of the circuit.

Answer: $V_{TH} = -41.6V$, $R_{TH} = 24\Omega$



Problem 4

Obtain the Thevenin and Norton equivalent circuits of the following circuit with respect to terminals a and b.

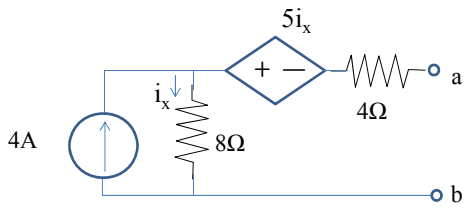


Answer: $V_{TH} = 3.788V$, $R_{TH} = R_N = 0.455\Omega$, $I_N = 8.325A$

Problem 5

Determine the Norton's equivalent at terminals a-b for the following circuit.

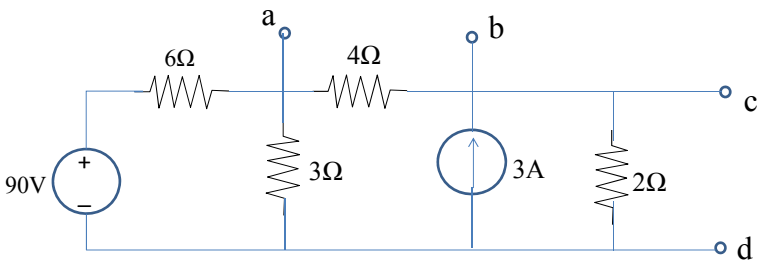
Answer: $I_N = 1.714A$, $R_N = 7\Omega$



Problem 6

Obtain the Norton's equivalent as viewed from terminals:
(a) a-b (b) c-d

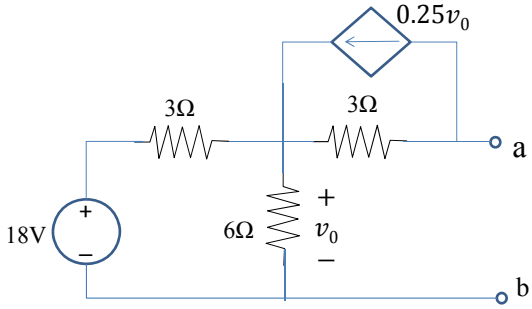
Answer: (a) a-b $R_N=2\Omega$, $I_N=6A$
(b) c-d $R_N=1.5\Omega$, $I_N=8A$



Problem 7

Find the Thevenin equivalent at terminals a-b of the circuit.

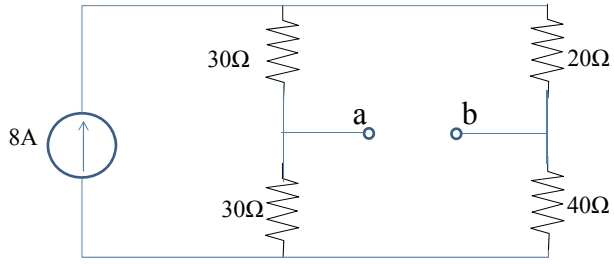
Answer: $V_{TH} = 3V$, $R_{TH} = 3.5\Omega$



Problem 8

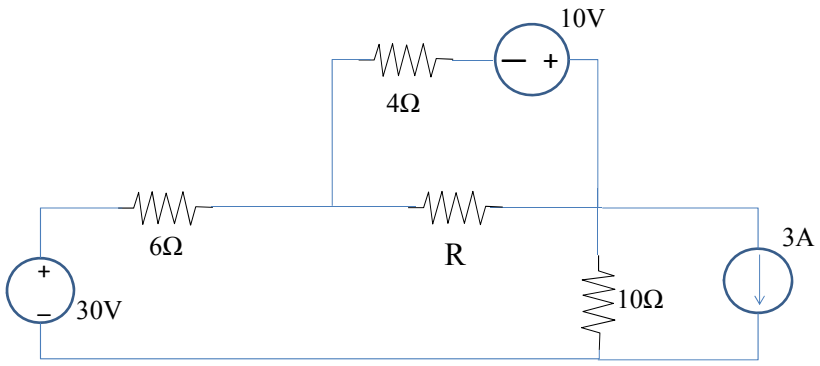
Determine the Thevenin's and Norton's equivalents at terminals a-b

Answer: $I_N = -1.371A$, $R_N = R_{TH} = 29.167\Omega$, $V_{TH} = -40V$



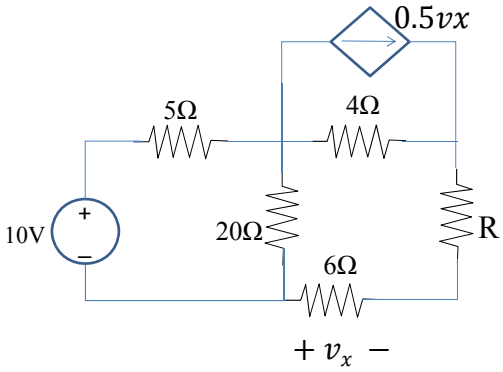
Problem 9

Find the maximum power that can be delivered to the resistor R in the following circuit. Answer: $V_{TH} = 4V$, $R_{TH}=3.2\Omega$, $P_{max}=1.25W$



Problem 10

Determine the maximum power delivered to the variable resistor R shown in the circuit. *Answer*: $V_{th} = 8V, R_{th} = 26\Omega, p_{max} = 0.615W$



Problem 11

Determine the maximum power that can be delivered to the variable resistor R in the circuit. Answer: P_{max}=14.424W