

Find the Thevenin equivalent circuit as seen by the 3- Ω resistor for the circuit of Figure P3.51.

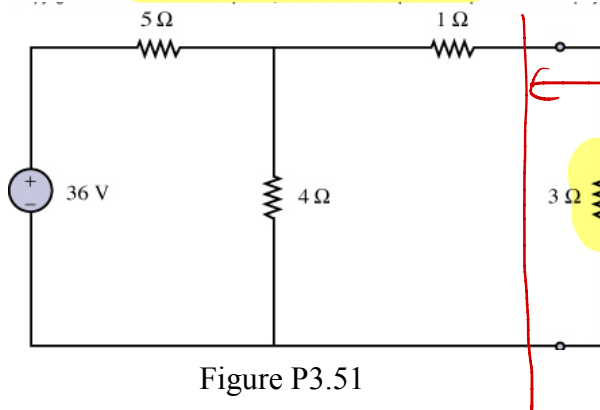
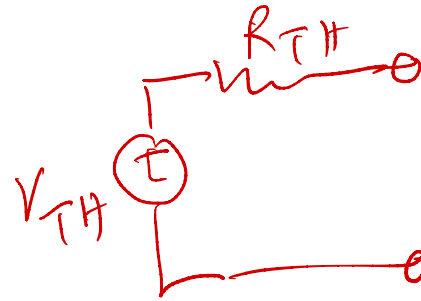


Figure P3.51



Q2. Problem 3.52

Find the Thevenin equivalent circuit as seen by the 3 Ω resistor in Figure P3.52

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

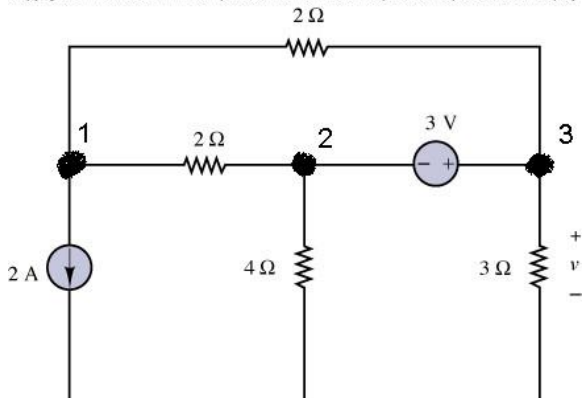


Figure P3.52

Q3. Problem 3.54

Find the Norton equivalent circuit to the left of the terminals a and b

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

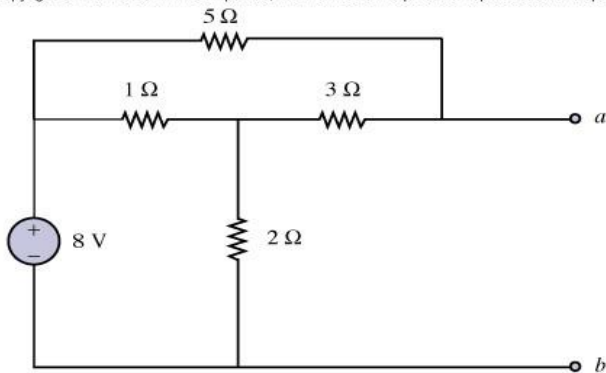


Figure P3.54

Q2

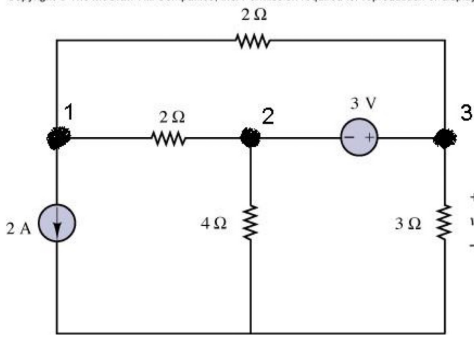
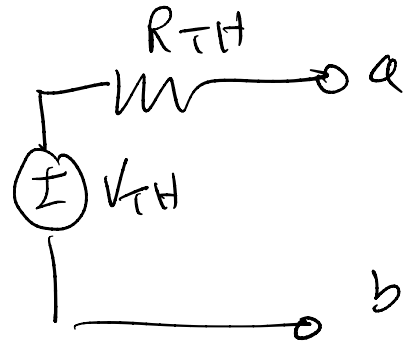
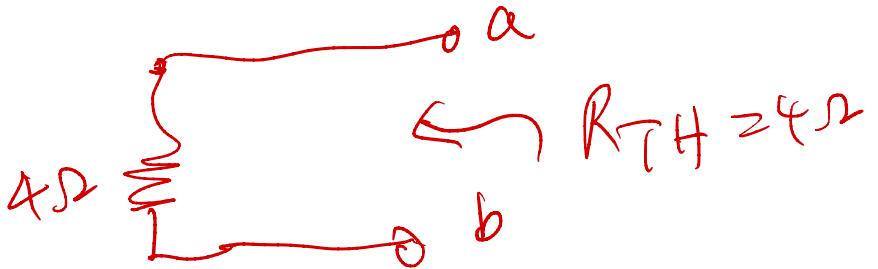
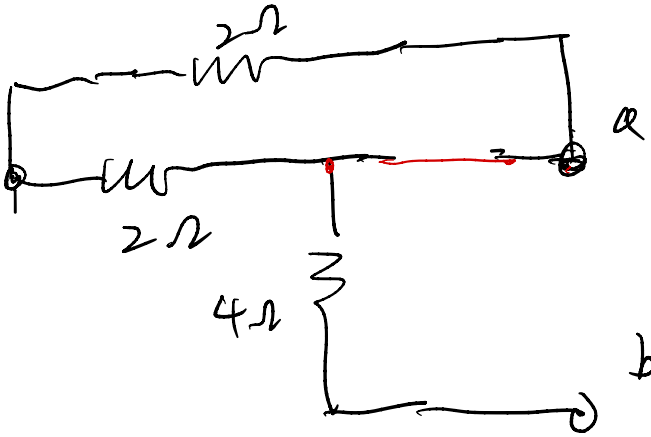


Figure P3.52



$R_{TH} = \text{o.c} \rightarrow 2A$, s.c $\rightarrow 3V$



22)

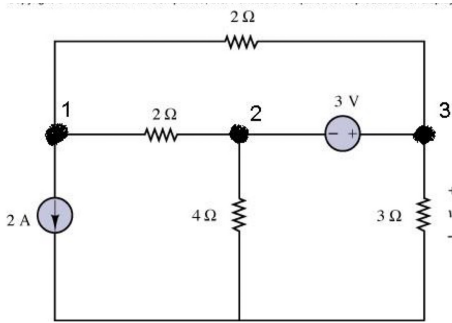
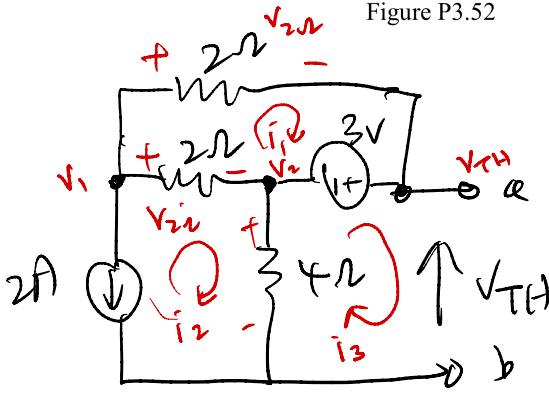


Figure P3.52



if we apply mesh analysis

$$\begin{cases} i_2 = -2A \\ i_3 = 0A \\ i_1 = ?? \end{cases} \rightarrow v_{TH}$$

if we apply nodal analysis

$$\begin{aligned} V_1 &= -2A \\ V_2 &= 0 \\ V_{TH} &= \checkmark \end{aligned}$$

$$V_{TH} = (i_2 - i_3)(4) + 3 = (-2)(4) + 3 = -5V$$

By KVL

$$\begin{aligned} V_{2\Omega} + 3 - V_{2\Omega} &= 0 \\ 2i_1 + 3 - (i_2 - i_1)(2) &= 0 \\ 2i_1 + 3 - (-2 - i_1)(2) &= 0 \\ 2i_1 + 3 + (2 + i_1)(2) &= 0 \\ 2i_1 + 3 + 4 + 2i_1 &= 0 \\ 4i_1 + 7 &= 0 \Rightarrow i_1 = -\frac{7}{4}A \end{aligned}$$

So

$$\Rightarrow v = (-5) \frac{3}{4+3} = -2.14V$$

Q2)

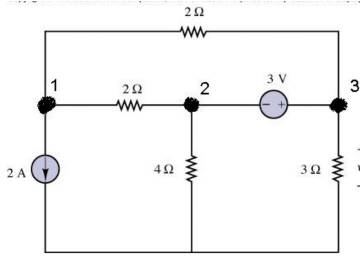
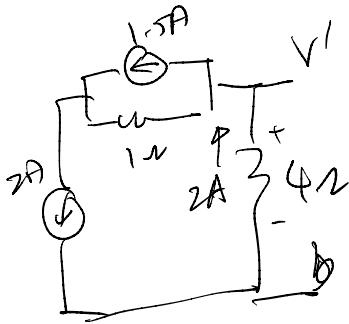
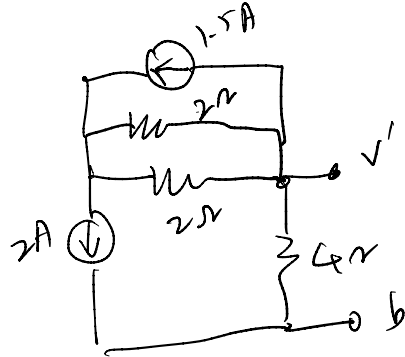
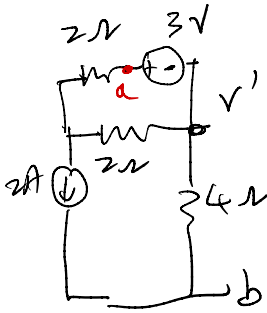
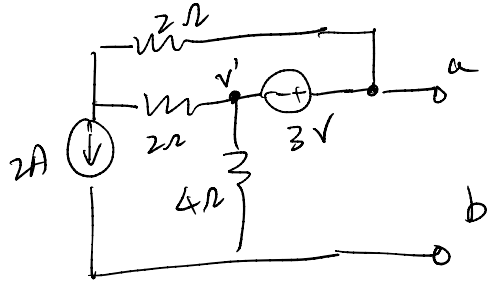


Figure P3.52

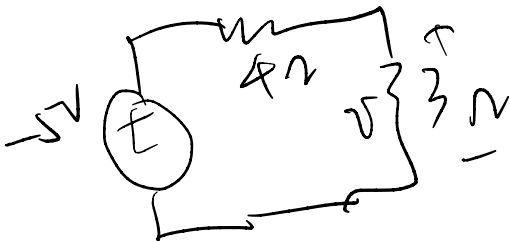


$$v' = -4(2)$$

$$v_{TH} = v' + 3V = -5V$$

To combine with previous working and including the 3Ω, we have

$$v = -5 \frac{3}{4+3} = -2.14V$$



Q1)

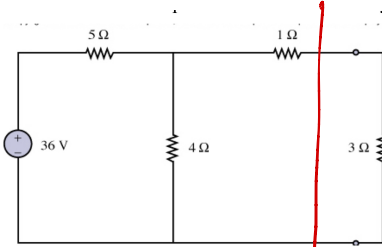
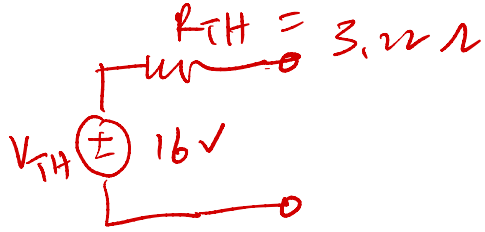
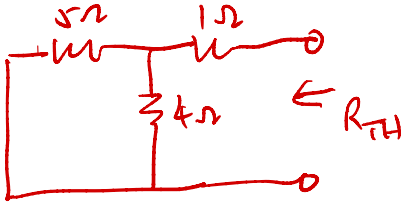


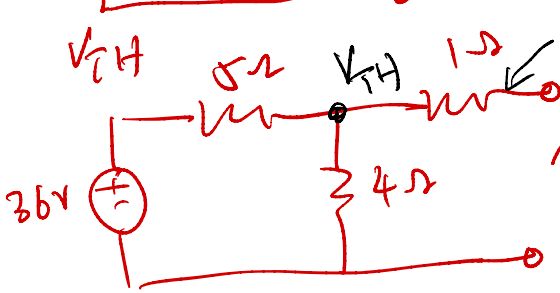
Figure P3.51



R_{TH} : s.c. voltage source



$$R_{TH} = 1 + 5 \parallel 4$$



$$I_{1\Omega} = 0$$

$$\begin{aligned} \uparrow V_{TH} &= 36 \frac{4}{5+4} \\ &= \frac{36 \times 4}{9} = 16V \end{aligned}$$