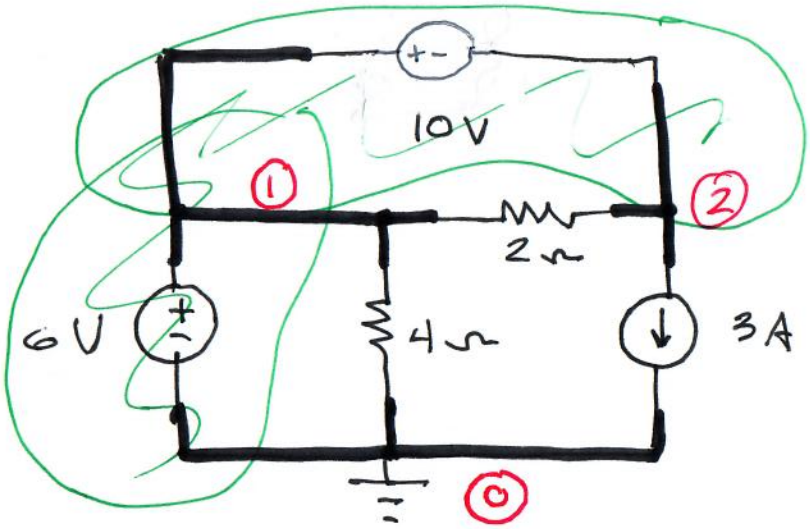
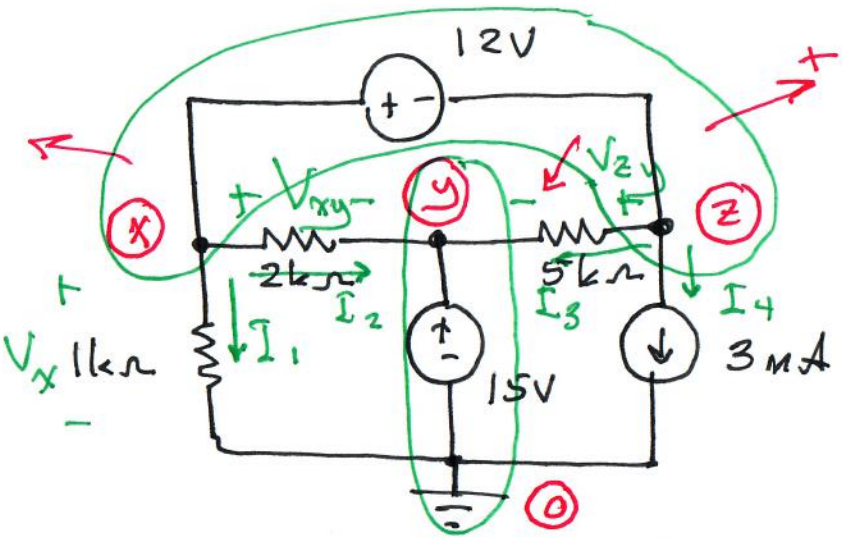


$V_1 = 6\ V$

$V_1 - V_2 = 10\ V$

$$\begin{bmatrix} 1 & 0 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} V_1 \\ V_2 \end{bmatrix} = \begin{bmatrix} 6 \\ 10 \end{bmatrix}$$



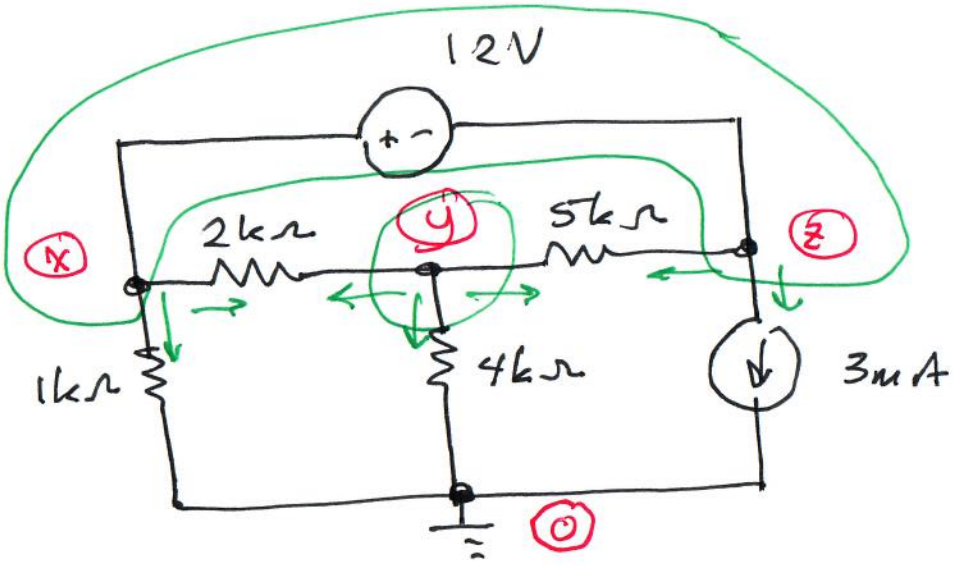
1. $V_y = 15\,V$

2. $V_x - V_z = 12\,V$

$I_1 + I_2 + I_3 + I_4 = 0$

3. $+\frac{V_x}{1k\Omega} + \frac{V_x - V_y}{2k\Omega} + \frac{V_z - V_y}{5k\Omega} + 3mA = 0$ (KCL)

$$\begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & -1 \\ 3/2000 & -7/10000 & 1/5000 \end{bmatrix} \begin{bmatrix} V_x \\ V_y \\ V_z \end{bmatrix} = \begin{bmatrix} 15 \\ 12 \\ -\frac{3}{1000} \end{bmatrix}$$



$$\frac{V_x - V_y}{2k\Omega}$$

$$- \frac{V_y - V_x}{2k\Omega}$$

$$V_x - V_z = 12V$$

$$\frac{V_x}{1000} + \frac{V_x - V_y}{2000} + \frac{V_z - V_y}{5000} + \frac{3}{1000} = 0$$

$$\frac{V_y - V_x}{2k\Omega} + \frac{V_y}{4k\Omega} + \frac{V_y - V_z}{5k\Omega} = 0$$

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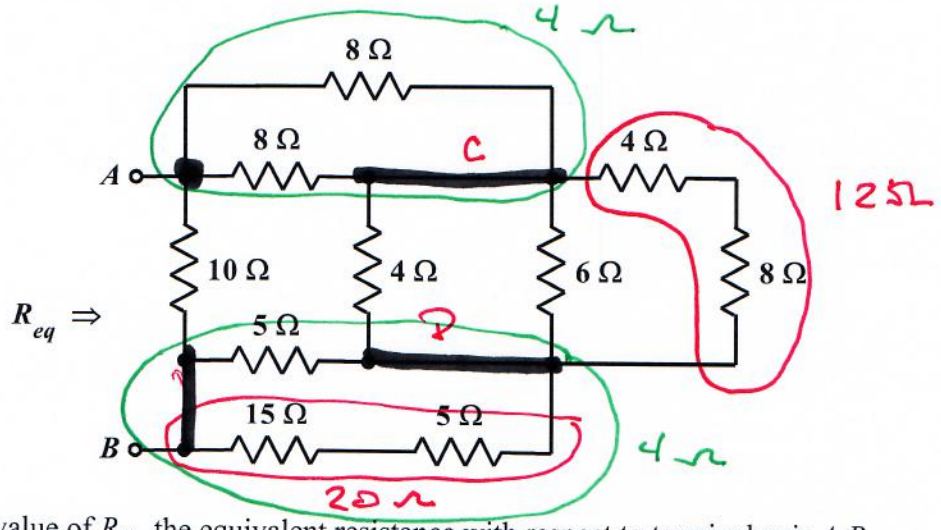
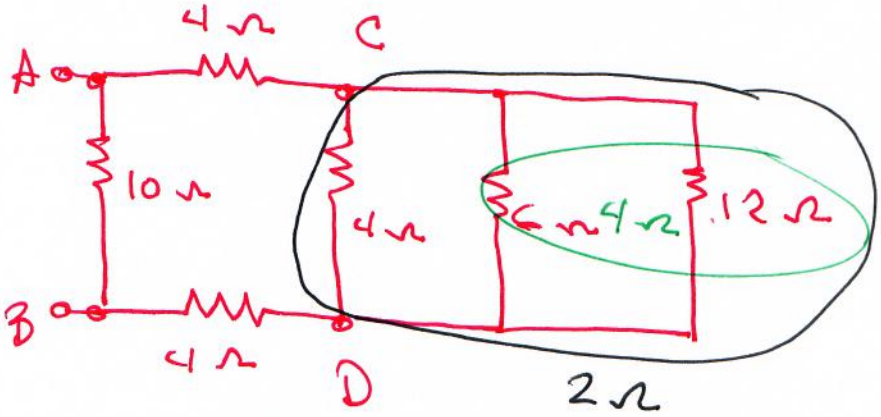
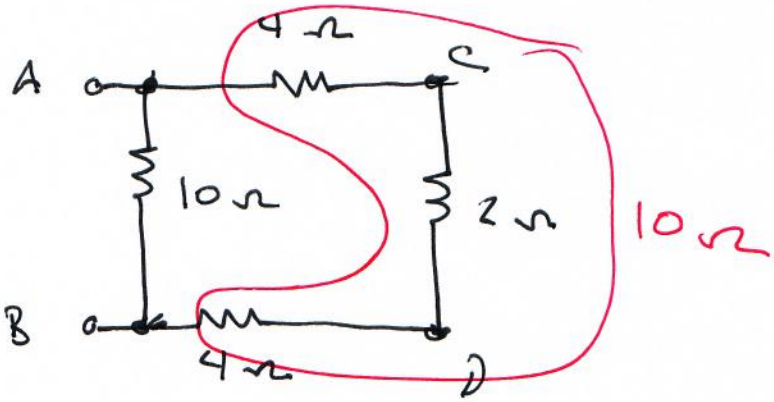
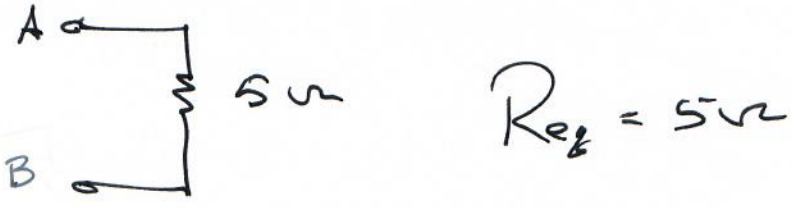
Homework Problem #007

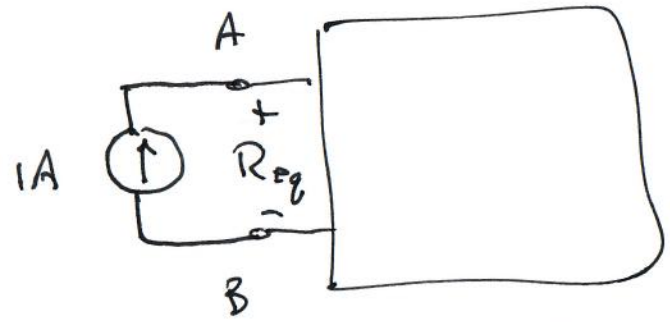


Determine the value of R_{eq}, the equivalent resistance with respect to terminal pair *A-B*.

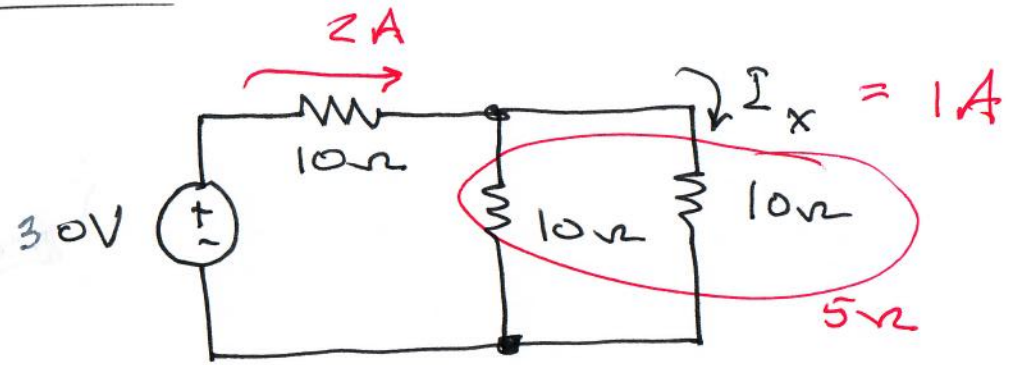


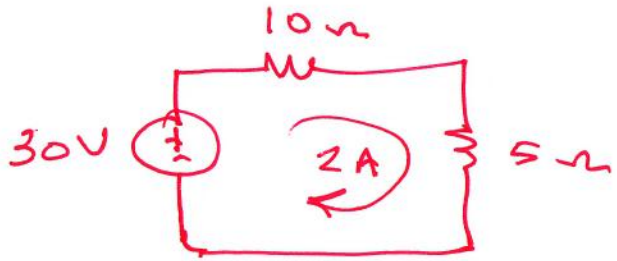


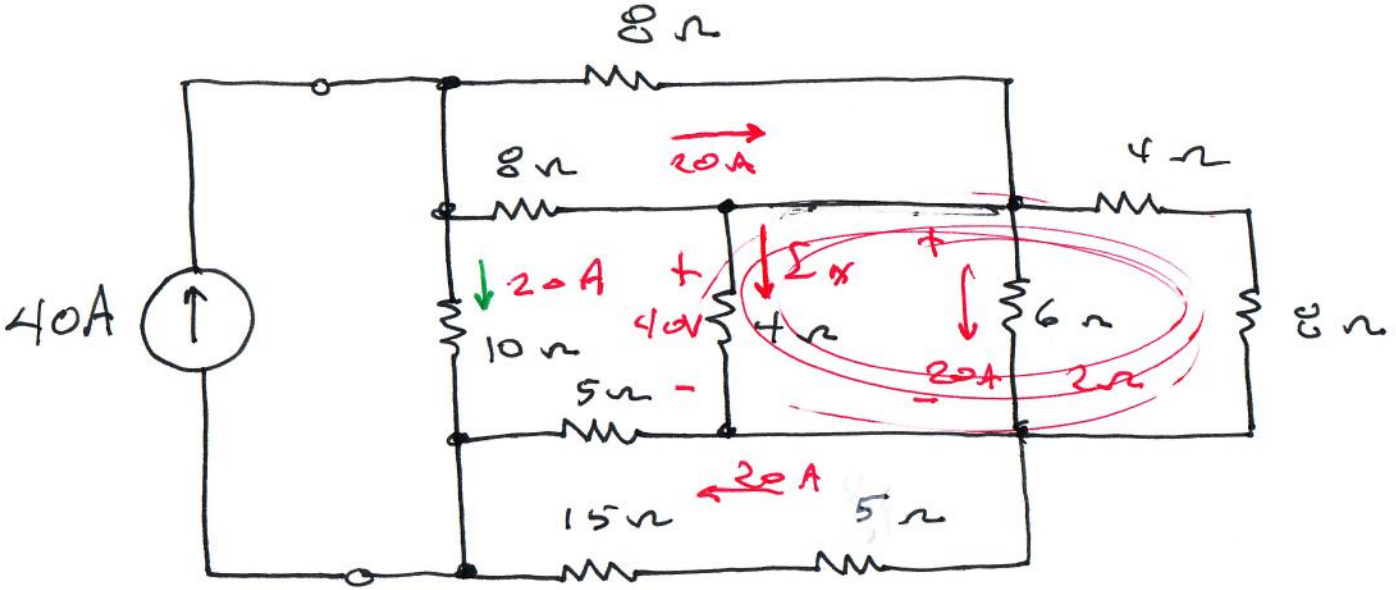


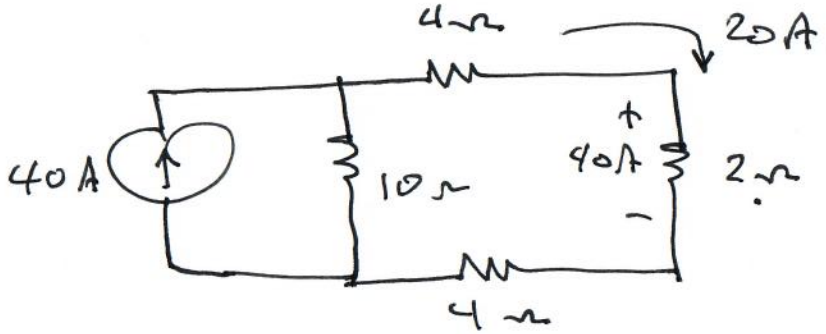


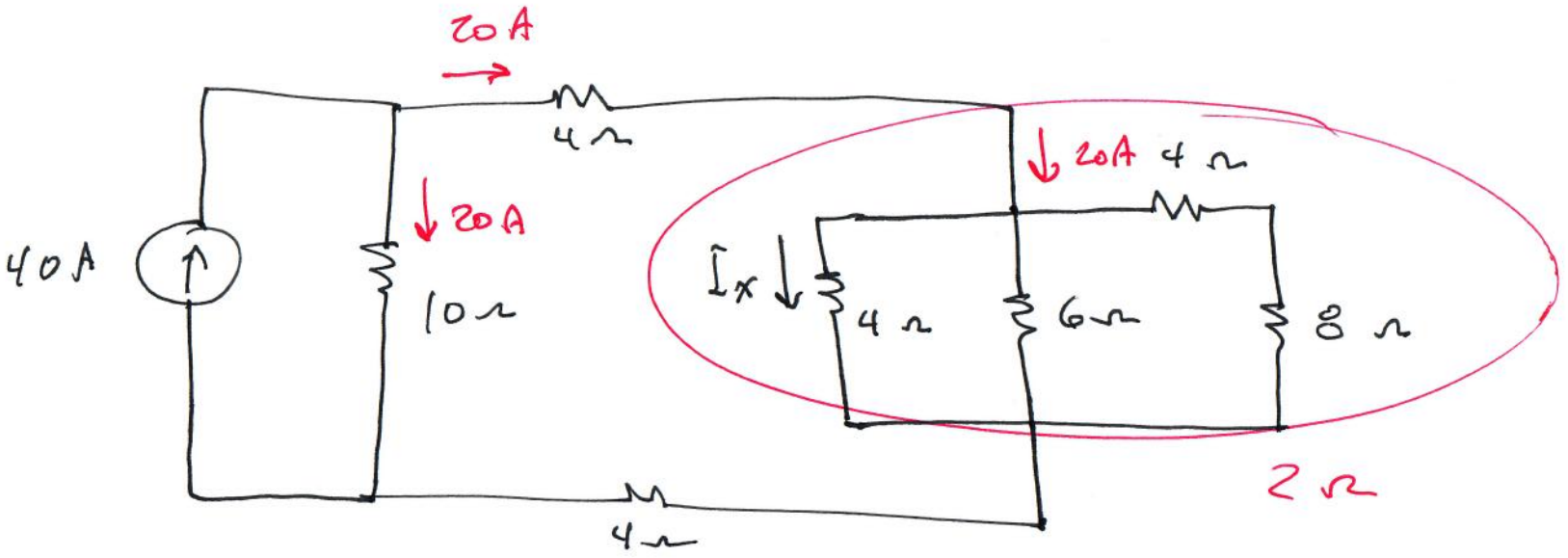
Current Divider






8 Ω
8 Ω
20A
4 Ω
40A
2 A
10 Ω
40V
4 Ω
6 Ω
6 Ω
20A
2Ω
5Ω
20A
15Ω
5 Ω

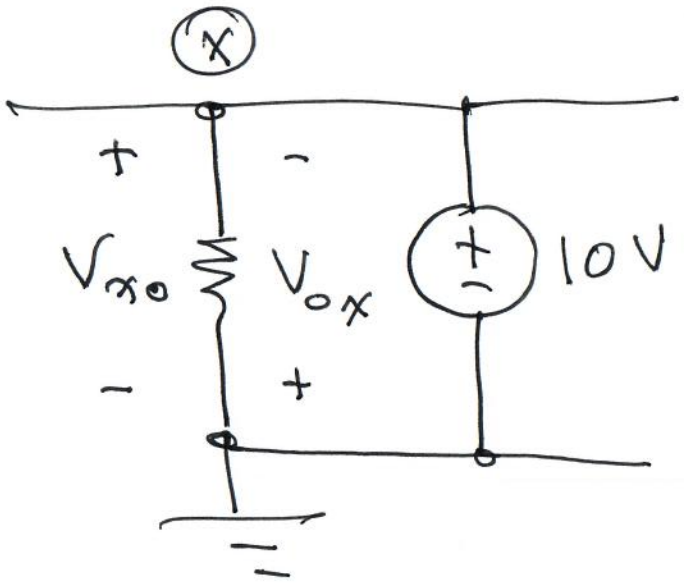

4Ω
20A
40A
10Ω
40A
2Ω
4Ω



$$I_x = \frac{\frac{1}{4}}{\frac{1}{4}+\frac{1}{6}+\frac{1}{12}} \cdot 20A$$

$$= \frac{\frac{6}{24}}{\frac{6+4+2}{24}} \cdot 20$$

$$= \frac{1}{2} \cdot 20 = 10A$$



$$V_{xo} = V_x - V_o \quad (V_o = 0)$$

$$= V_x$$

$$V_{ox} = V_o - V_x \quad (V_o = 0)$$

$$= -V_x$$