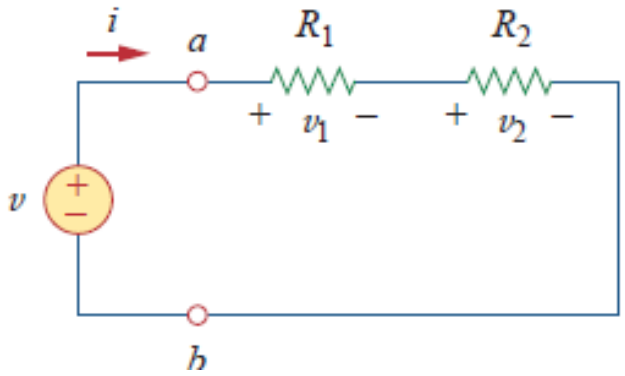


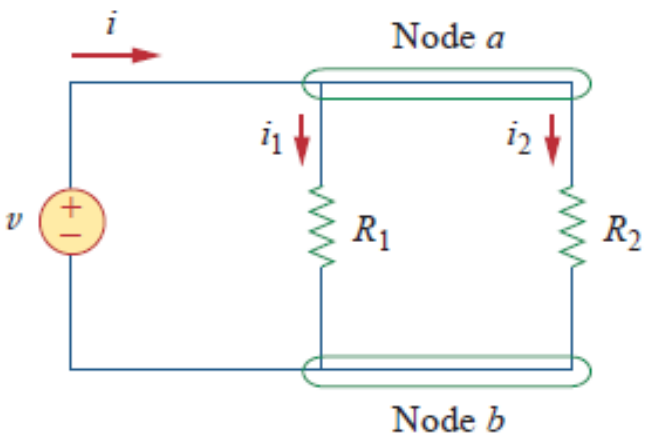
$v_1 = iR_1, \qquad v_2 = iR_2$

$-v + v_1 + v_2 = 0$

$v = v_1 + v_2 = i(R_1 + R_2) \qquad i = \dfrac{v}{R_1 + R_2} \qquad R_{\text{eq}} = R_1 + R_2$

$$R_{\text{eq}} = R_1 + R_2 + \cdots + R_N = \sum_{n=1}^{N} R_n$$

$$v_1 = \frac{R_1}{R_1 + R_2} v, \qquad v_2 = \frac{R_2}{R_1 + R_2} v$$



$$v = i_1 R_1 = i_2 R_2$$

$$i_1 = \frac{v}{R_1}, \qquad i_2 = \frac{v}{R_2}$$

$$i = i_1 + i_2$$

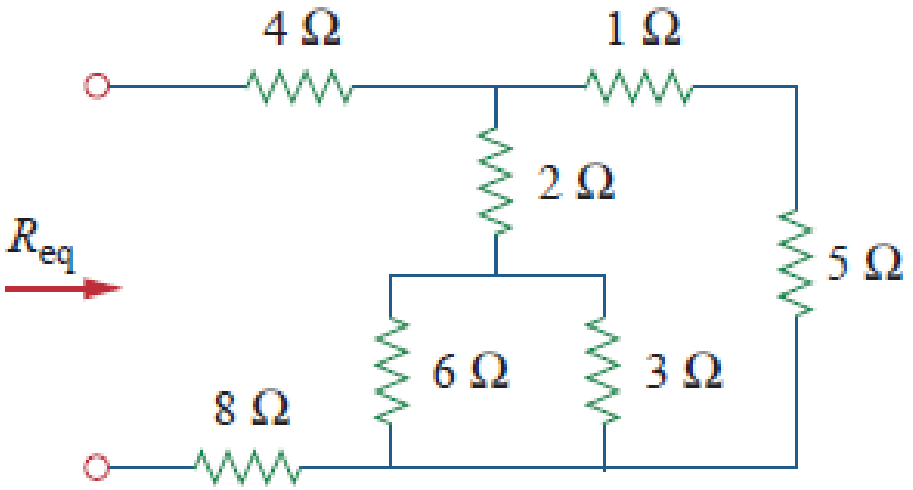
$$i = \frac{v}{R_1} + \frac{v}{R_2} = v\left(\frac{1}{R_1} + \frac{1}{R_2}\right) = \frac{v}{R_{\text{eq}}} \qquad \frac{1}{R_{\text{eq}}} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$\frac{1}{R_{\text{eq}}} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots + \frac{1}{R_N}$$

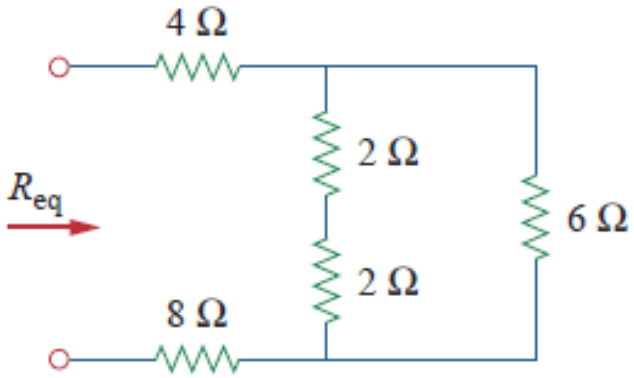
$$R_{\text{eq}} = \frac{R_1 R_2}{R_1 + R_2}$$

$$i_1 = \frac{R_2\, i}{R_1 + R_2}, \qquad i_2 = \frac{R_1\, i}{R_1 + R_2}$$

$$G_{\text{eq}} = G_1 + G_2 + G_3 + \cdots + G_N$$



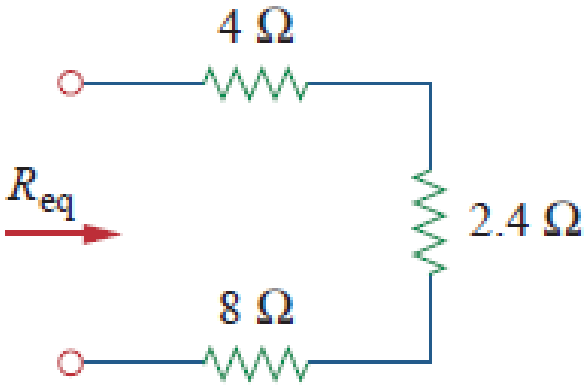
$$1\ \Omega + 5\ \Omega = 6\ \Omega$$



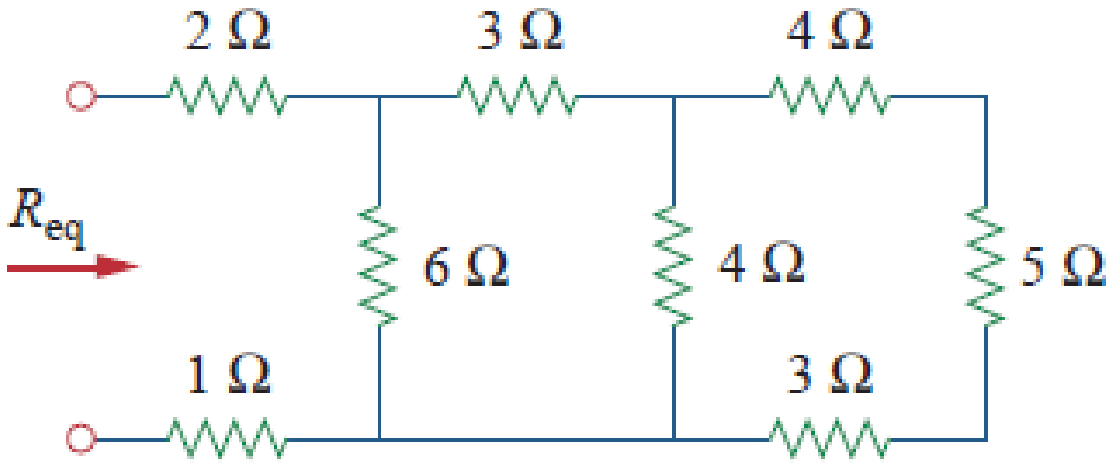
$$2\ \Omega + 2\ \Omega = 4\ \Omega$$

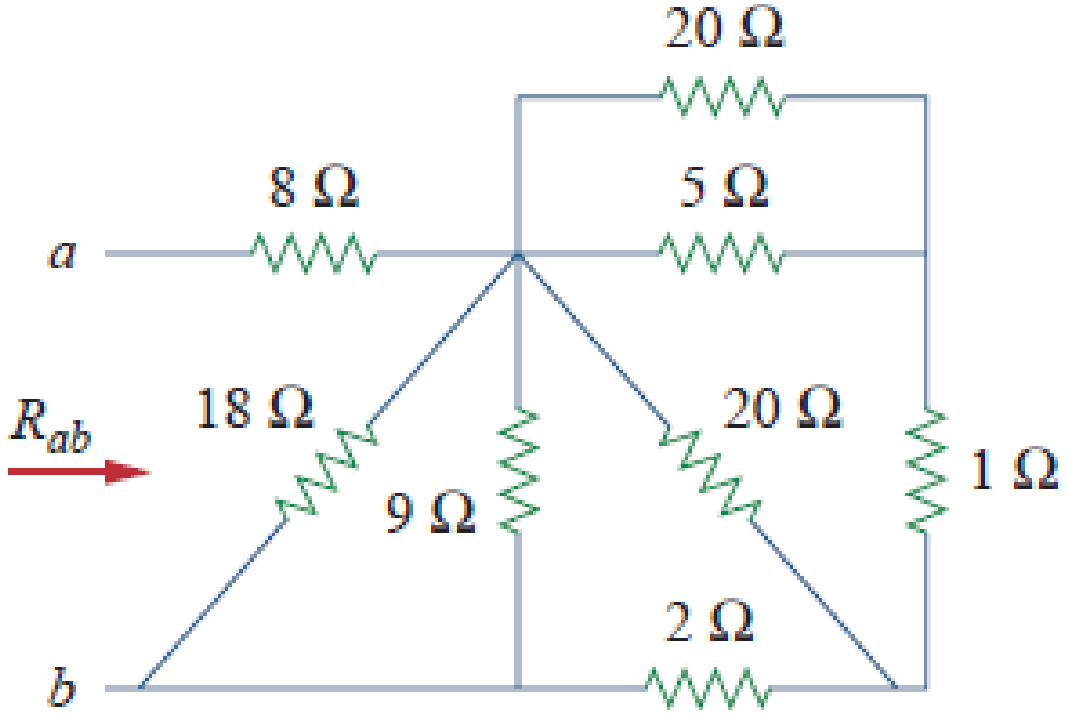
$$4\ \Omega \parallel 6\ \Omega = \frac{4 \times 6}{4 + 6} = 2.4\ \Omega$$

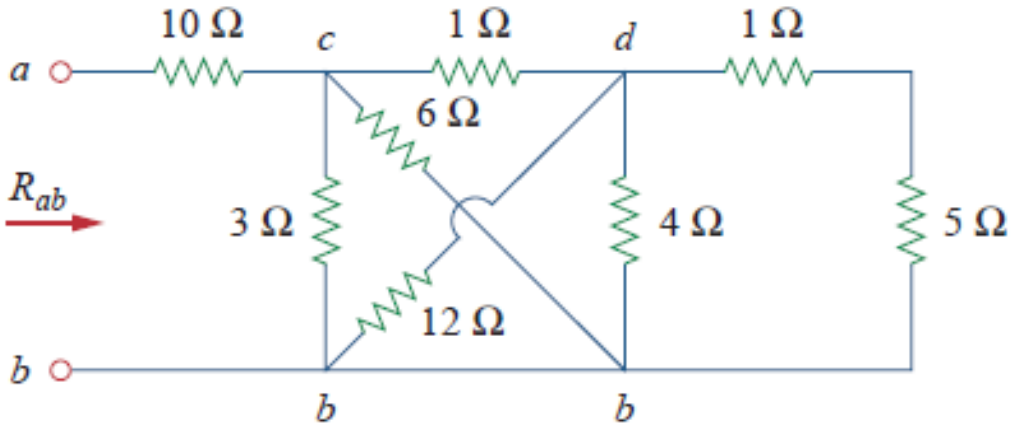
$$6\ \Omega \parallel 3\Omega = \frac{6 \times 3}{6 + 3} = 2\ \Omega$$

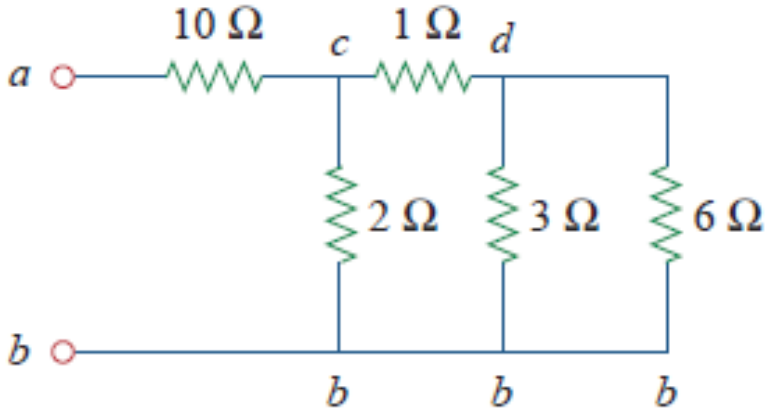


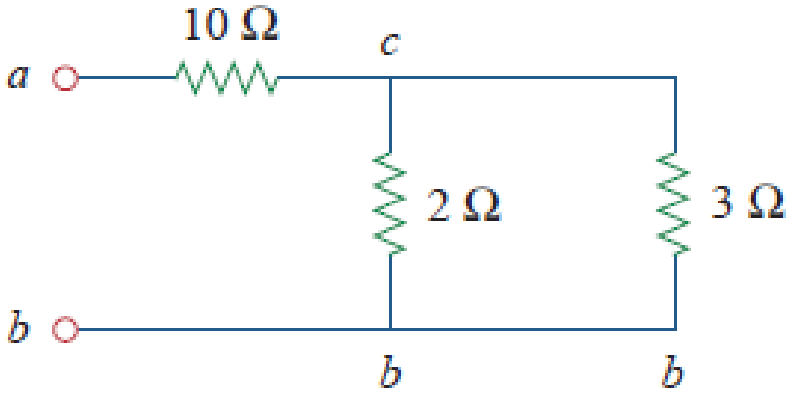
$$R_{eq} = 4\ \Omega + 2.4\ \Omega + 8\ \Omega = 14.4\ \Omega$$


2 Ω
3 Ω
4 Ω
R_{eq}
6 Ω
4 Ω
5 Ω
1 Ω
3 Ω

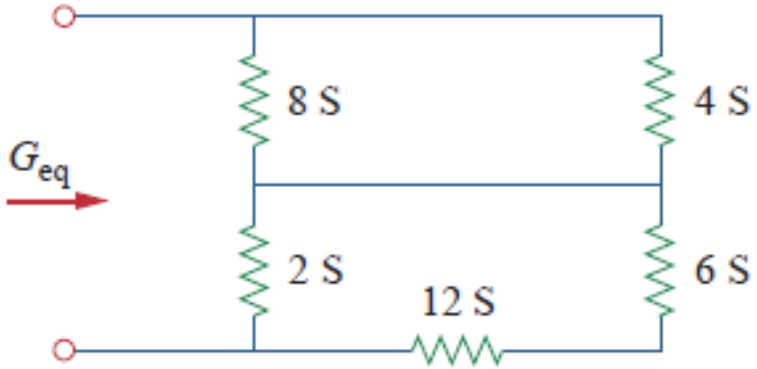

20 Ω
8 Ω
5 Ω
a
R_{ab}
18 Ω
20 Ω
9 Ω
1 Ω
2 Ω
b

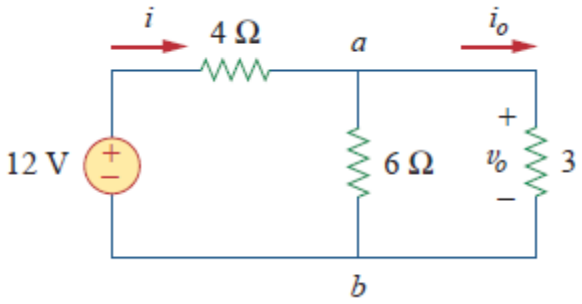




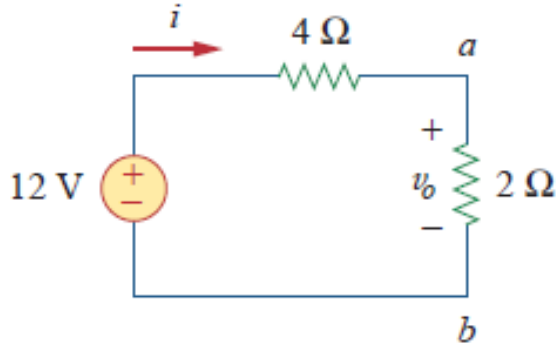


$$R_{ab} = 10 + 1.2 = 11.2\ \Omega$$





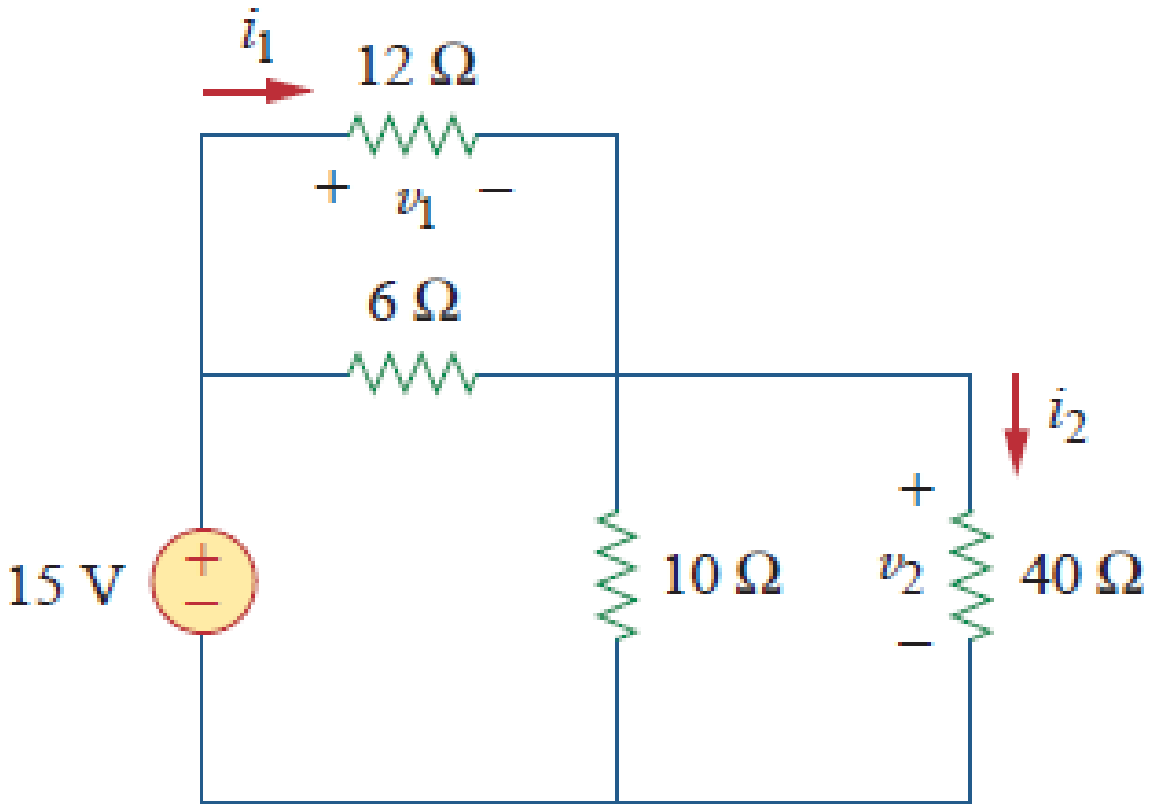
$$i_o = \frac{6}{6+3} i = \frac{2}{3}(2\text{ A}) = \frac{4}{3}\text{ A}$$

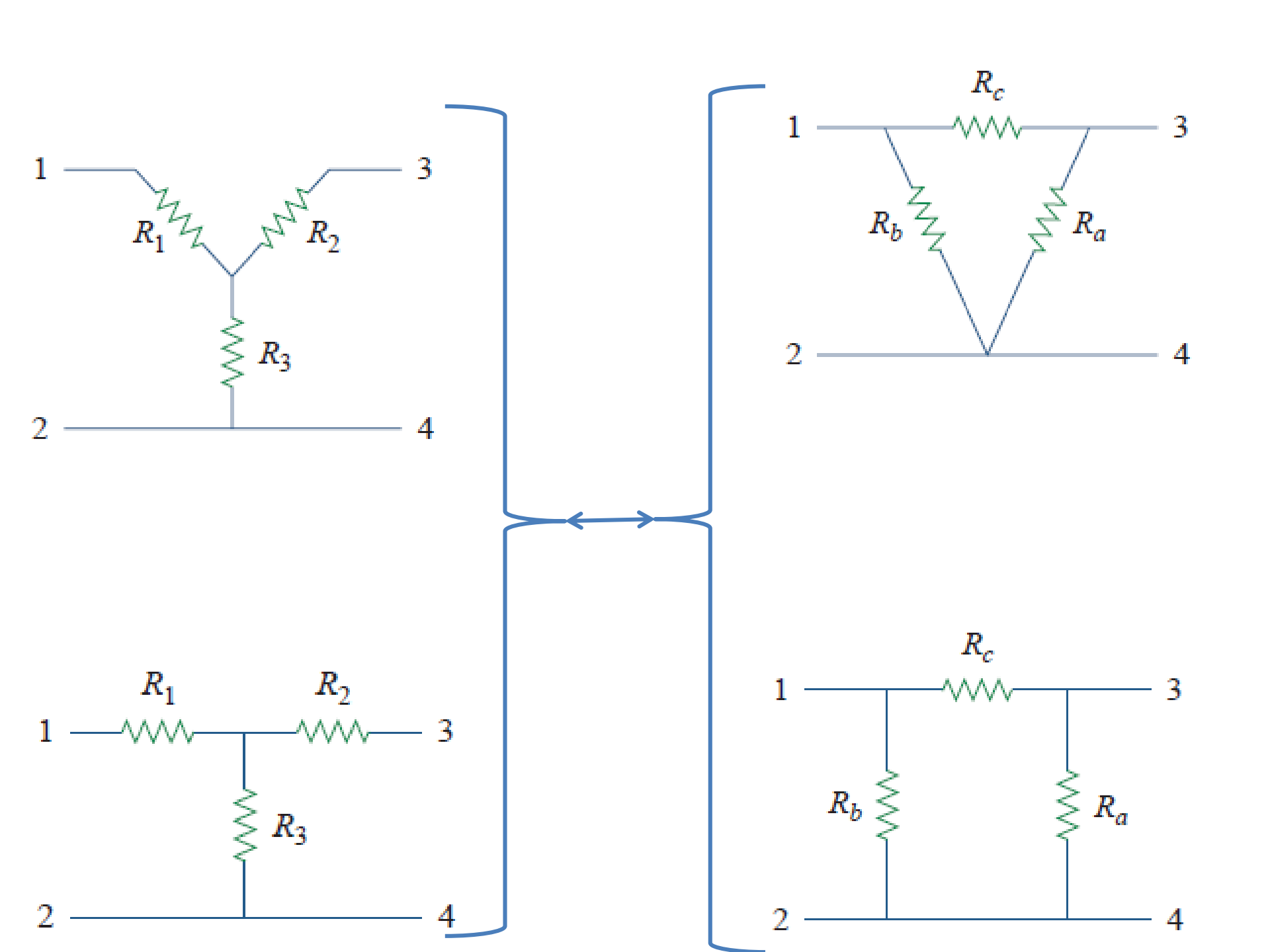


$$v_o = \frac{2}{2+4}(12\text{ V}) = 4\text{ V}$$

$$v_o = 3i_o = 4 \quad \Rightarrow \quad i_o = \frac{4}{3}\text{ A}$$

$$p_o = v_o i_o = 4\left(\frac{4}{3}\right) = 5.333\text{ W}$$


i_1
12 Ω
+ v_1 −
6 Ω
i_2
+
15 V
10 Ω
v_2
40 Ω
−


1
3
R_1
R_2
R_3
2
4
R_c
1
3
R_b
R_a
2
4
R_1
R_2
1
3
R_3
2
4
R_c
1
3
R_b
R_a
2
4

$$R_1 = \frac{R_b R_c}{R_a + R_b + R_c}$$

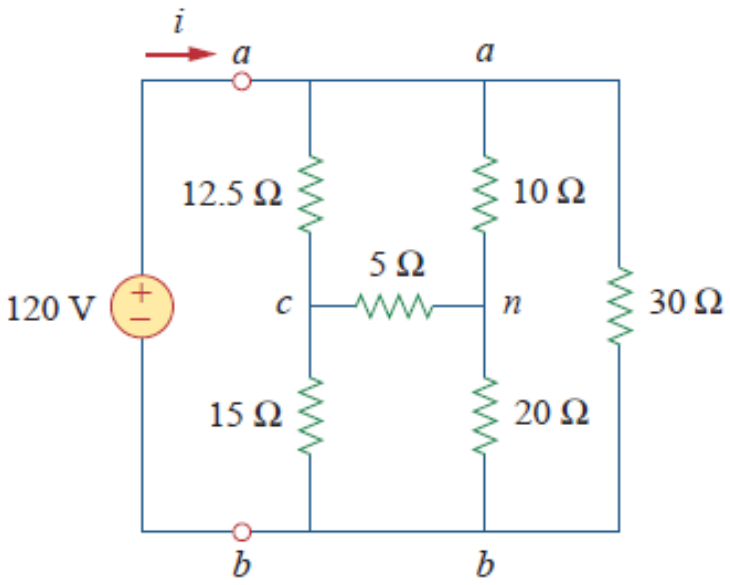
$$R_2 = \frac{R_c R_a}{R_a + R_b + R_c}$$

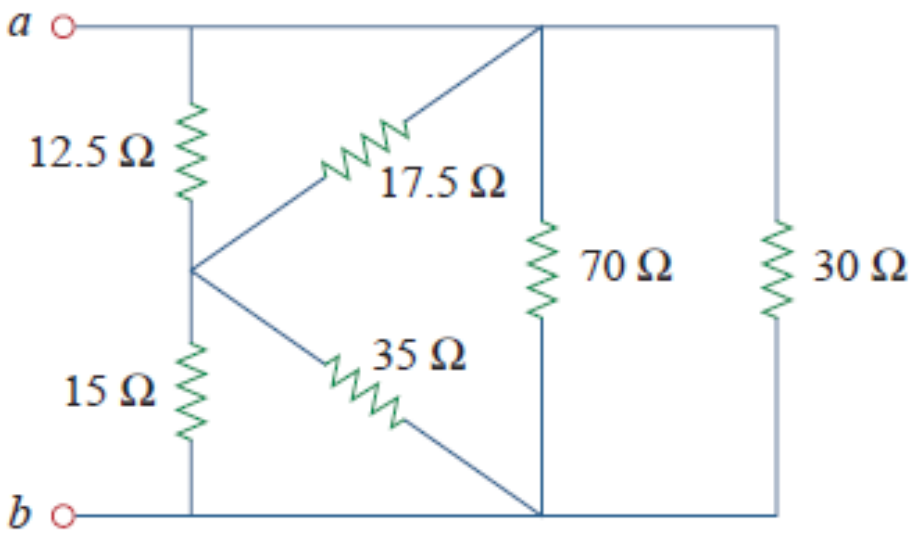
$$R_3 = \frac{R_a R_b}{R_a + R_b + R_c}$$

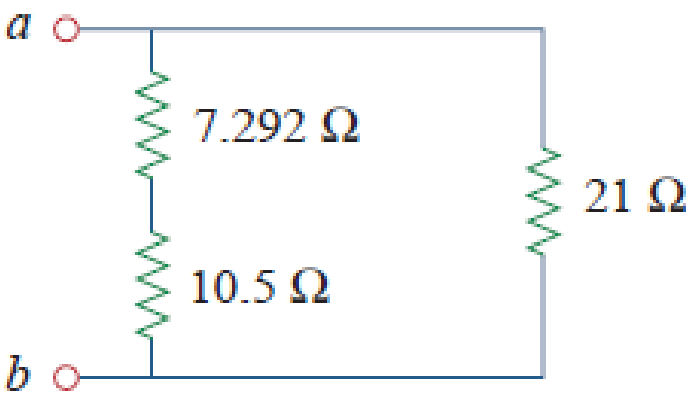
$$R_a = \frac{R_1 R_2 + R_2 R_3 + R_3 R_1}{R_1}$$

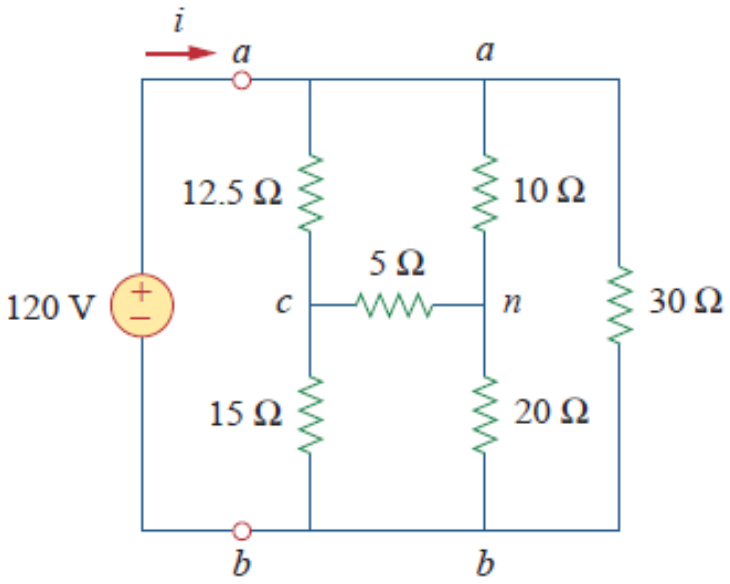
$$R_b = \frac{R_1 R_2 + R_2 R_3 + R_3 R_1}{R_2}$$

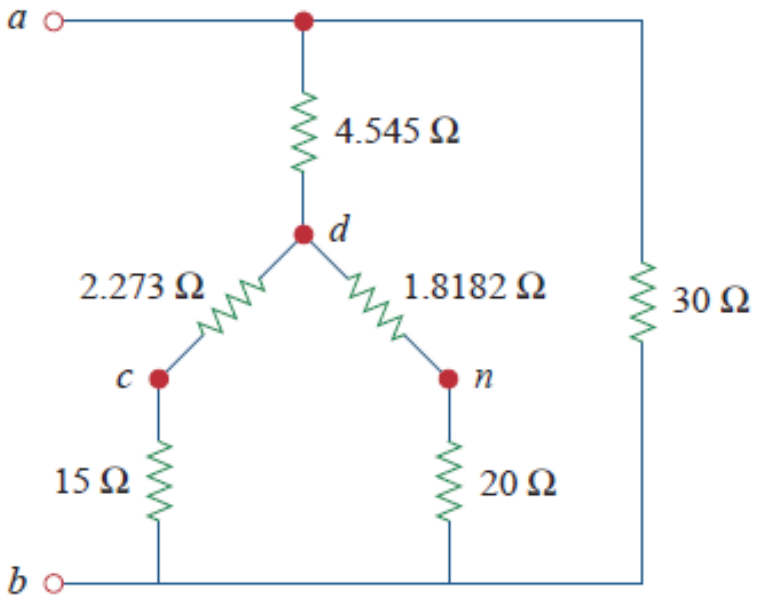
$$R_c = \frac{R_1 R_2 + R_2 R_3 + R_3 R_1}{R_3}$$


i
a
a
12.5 Ω
10 Ω
5 Ω
120 V
c
n
30 Ω
15 Ω
20 Ω
b
b


a
12.5 Ω
17.5 Ω
70 Ω
30 Ω
35 Ω
15 Ω
b


a
7.292 Ω
21 Ω
10.5 Ω
b





$$i = \frac{v_s}{R_{ab}} = \frac{120}{9.631} = \mathbf{12.46\ A}$$