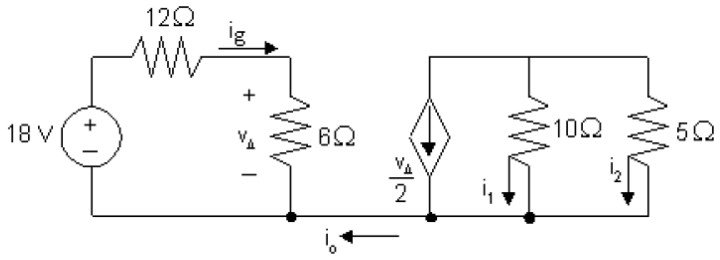
Homework Set #5
DUE Monday, March 20, 2017

1. Problem 2.35 *(answer: i_2 = -2 A)*

[a] $i_o = 0$ because no current can exist in a single conductor connecting two parts of a circuit.

[b]



$$18 = (12+6)i_g \qquad i_g = 1 \text{ A}$$

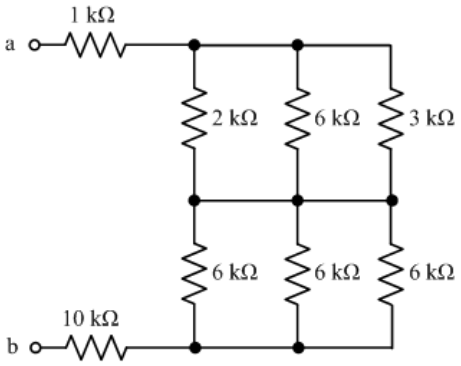
$$v_\Delta = 6i_g = 6\text{V} \qquad v_\Delta/2 = 3 \text{ A}$$

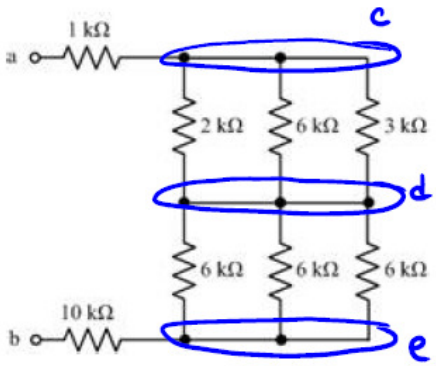
$$10i_1 = 5i_2, \text{ so } i_1 + 2i_1 = -3 \text{ A; therefore, } i_1 = -1 \text{ A}$$

[c] $i_2 = 2i_1 = -2$ A.

2. For both circuits shown below, reduce to a single resistor at terminals a and b.

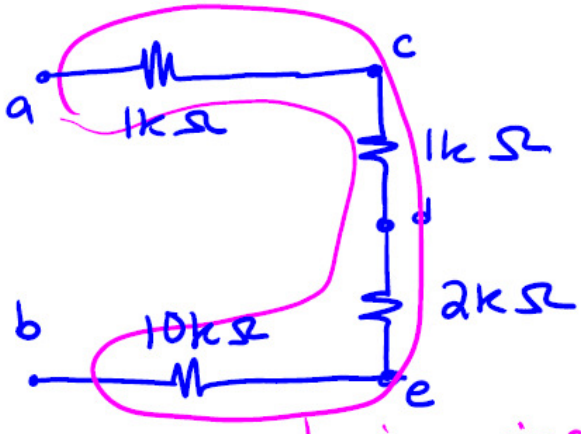
a)





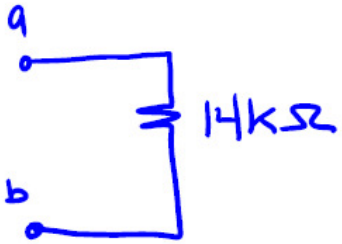
$2k \| 6k \| 3k = 1k\Omega$

$6k \| 6k \| 6k = 2k\Omega$

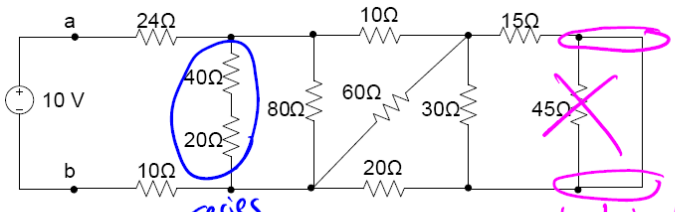


in series

$Req = (1+1+2+10)k = 14k\Omega$



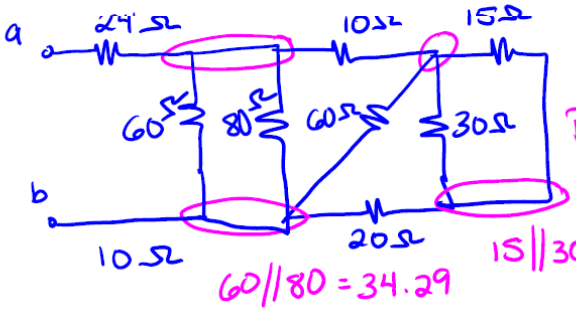
B)



series
40+20=60

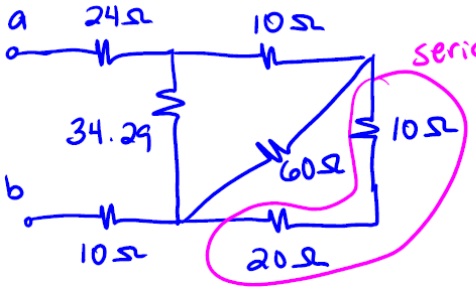
short in || w/ a resistor shorts out the resistor

$R_{eq} = \left(\frac{1}{45} + \frac{1}{0}\right)^{-1} = 0$

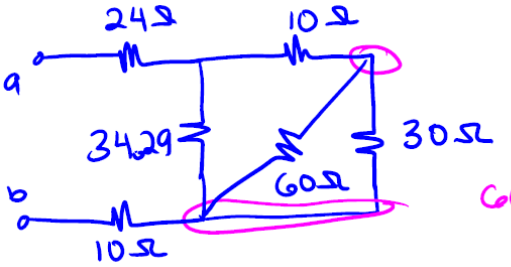


60||80 = 34.29

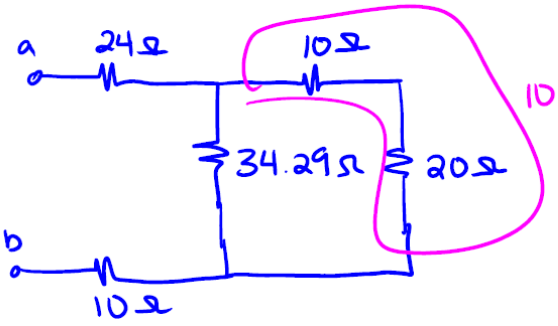
15||30 = 10Ω



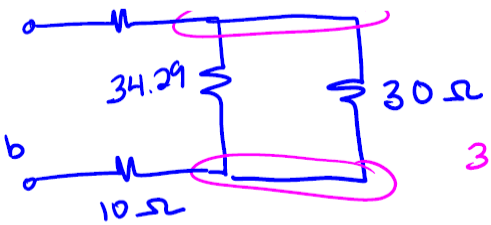
series 10+20=30



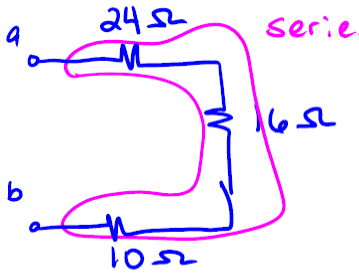
60||30 = 20Ω



10+20=30



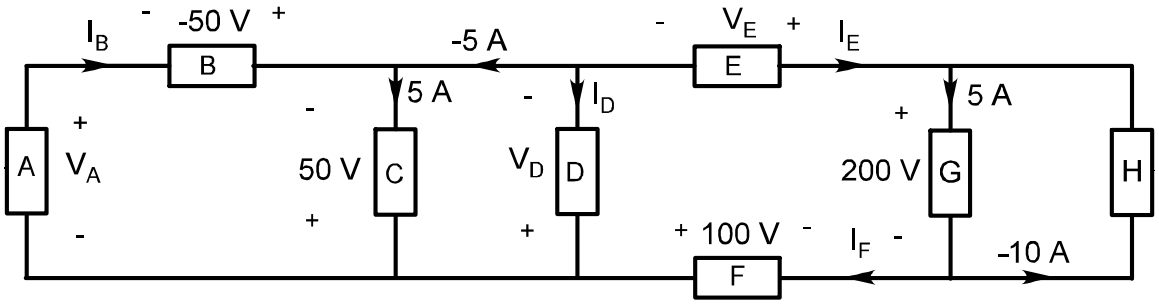
34.29||30 = 16



series = 24 + 16 + 10

=

3. Complete the table below. Observe the Passive Sign Convention.



Element	Voltage	Current	Power	Consumed/Produced?
A	0	+10	0	-
B	-50	+10	+500	C
C	+50	+5	-250	P
D	+50	-10	+500	C
E	-150	+15	-2250	P
F	+100	+15	-1500	P
G	+200	+5	+1000	C
H	+200	-10	+2000	C