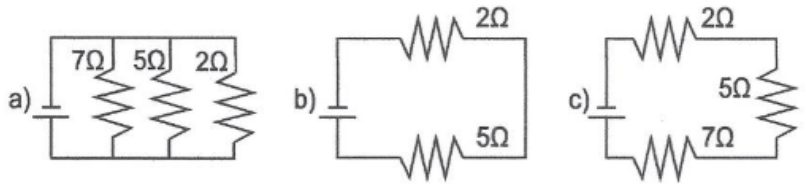
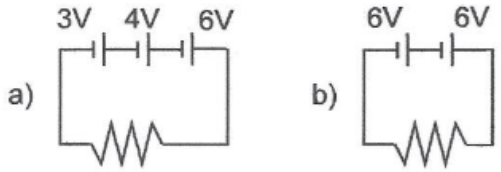
sources:
https://www.livingston.org/cms/lib9/NJ01000562/Centricity/Domain/833/circuitsolutions.pdf
3000 solved problems in physics, chapter 27

1. Determine the equivalent (total) resistance for each of the following circuits below.

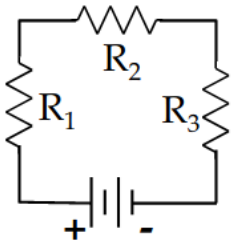


2. Determine the total voltage (electric potential) for each of the following circuits below.



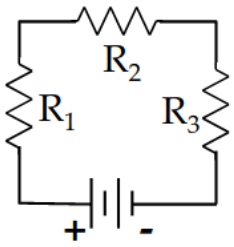
g) Fill out the table for the circuit diagramed at the right.

Circuit Position	Voltage (V)	Current (A)	Resistance (Ω)	Power (W)
1			10.0	
2			20.0	
3			30.0	
Total	6.00			



g) Fill out the table for the circuit diagramed at the right.

Circuit Position	Voltage (V)	Current (A)	Resistance (Ω)	Power (W)
1	1.0	0.10	10.0	0.1
2	2.0	0.10	20.0	0.2
3	3.0	0.10	30.0	0.3
Total	6.00	0.10	60	0.6



27.14 A copper bus bar carrying 1200 A has a potential drop of 1.2 mV along 24 cm of its length. What is the resistance per m of the bar?

I From Ohm's law, applied to 24 cm of the bar, $V_{24} = IR_{24}$, or $(1.2 \times 10^{-3}\,\text{V}) = (1200\,\text{A})R$, and $R_{24} = 1.0\,\mu\Omega$. By proportion, $R_{100} = (100/24)R_{24} = \underline{4.2\,\mu\Omega}$.

$V = IR \rightarrow R = \frac{V}{I} = \frac{1.2\times10^{-3}\,V}{1200\,A} = 1\,\mu\Omega$ (per 24 cm)

$R_{100} \times \frac{24}{100} = 1\,\mu\Omega \rightarrow R_{100} = 1\,\mu\Omega \times \frac{100}{24} = \boxed{4.2\,\mu\Omega}$

27.33 What is the resistance between *A* and *B* in Fig. 27-4?

10 Ω

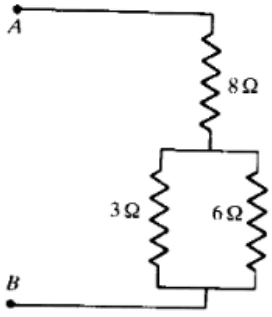


Fig. 27-4

find resistance between Points a and b

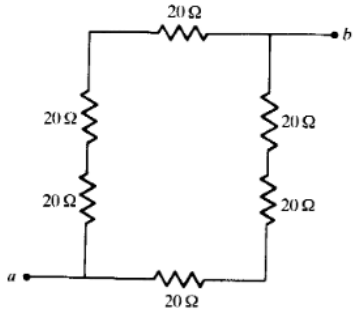
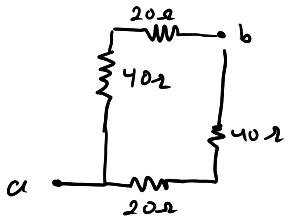
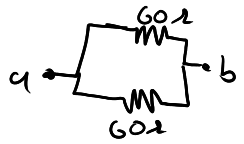


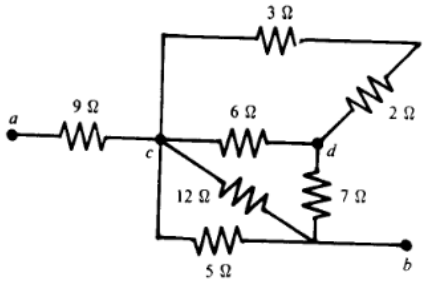
Fig. 27-5



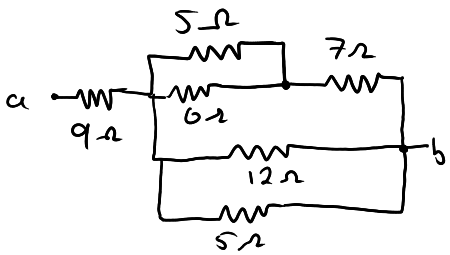


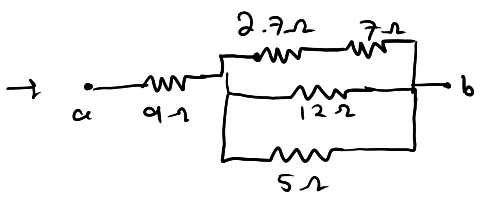
$R = \frac{1}{\frac{1}{60}+\frac{1}{60}} = \frac{1}{\frac{2}{60}} = \frac{60}{2} = 30\,\Omega$

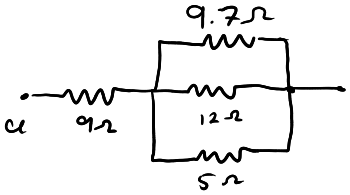
find the equivalent resistance in the figure



(a)







11.6 Ω