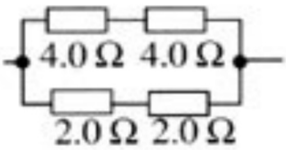
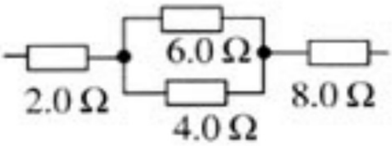
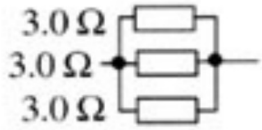






$R_s = 4.0\,\Omega + 4.0\,\Omega = 8.0\,\Omega$

$R_s = 2.0\,\Omega + 2.0\,\Omega = 4.0\,\Omega$

$R_p = \left(\frac{1}{8.0\,\Omega} + \frac{1}{4.0\,\Omega}\right)^{-1} = 2.7\,\Omega$

$R_s = 2 + 8 = 10$

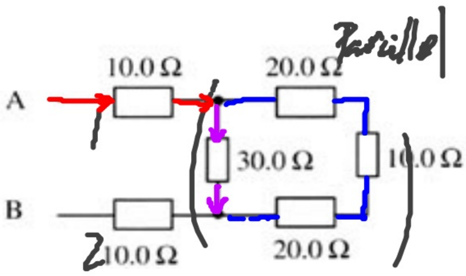
$R_p = \left(1/6 + 1/4\right)^{-1} = 2.4$

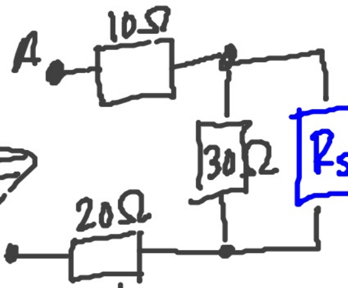
$R_t = R_s + R_p$

$R_t = 10 + 2.4 = 12.4\,\Omega$

$\left(\frac{1}{3} + \frac{1}{3} + \frac{1}{3}\right)^{-1} = 1\,\Omega$

What is the resistance between A and B in Figure 5.26?





$R_s = 10\Omega + 20\Omega + 20\Omega = 50\Omega$

$(10\Omega + 10\Omega) + \left[\left(\frac{1}{20+10+20}\right) + \left(\frac{1}{30}\right)\right]^{-1}$

$20\Omega + 18.8\Omega = 38.8\Omega = 39\Omega$

Each resistor in Figure 5.27 has a value of 6.0 Ω. Calculate the resistance of the combination.

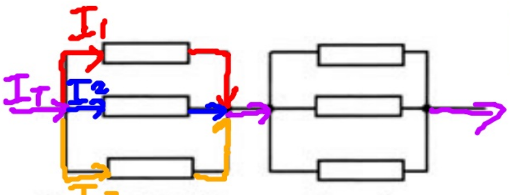


Figure 5.27 For question 3.

$$\left(\frac{1}{6}+\frac{1}{6}+\frac{1}{6}\right)^{-1}+\left(\frac{1}{6}+\frac{1}{6}+\frac{1}{6}\right)^{-1}$$

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

$$= 4.0\Omega$$

You are given one hundred 1 Ω resistors. What is the smallest and largest resistance you can make in a circuit using these?

100 1Ω resistors

series circuit resistance $=(1+1+1+1.........)$

(100Ω) for series

$\leq 1.0 \cdot 10^2$

parallel circuit

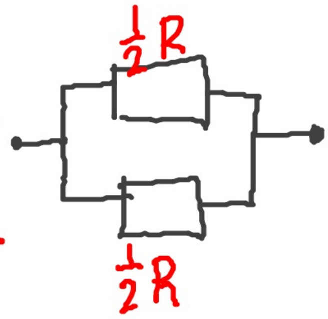
$(1+1+1......)^{-1}=(100)^{-1}$

$=(1.0\cdot10^2)^{-1}=1.0\cdot10^{-2}$ parallel

$=.01$

9

A wire that has resistance R is cut into two equal pieces. The two parts are joined in parallel. What is the resistance of the combination?



$R = \frac{\rho L}{A}$

$R \propto L$

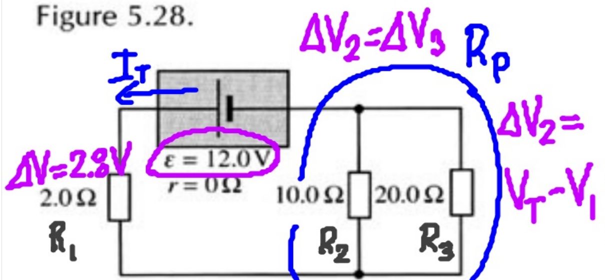
$\frac{1}{2}L \Rightarrow \frac{1}{2}R$

$\left(\frac{1}{\frac{1}{2}R} + \frac{1}{\frac{1}{2}R}\right)^{-1} = R_T$

$\left(\frac{2}{R} + \frac{2}{R}\right)^{-1} = \left(\frac{4}{R}\right)^{-1} = R/4$

Bc it says the wire was split in 2 equal parts

Find the current in, and potential difference across, each resistor in the circuits shown in Figure 5.28.



	V	I	R
R_1	2.8V	1.4A	2.0Ω
R_2	9.2V	.92A	10.0Ω
R_3	9.2V	.46	20.0Ω
Total	12V	1.4A	8.7Ω

① Find R_T (equivalent resistance)

R_2 & R_3 are in parallel so

$R_p = \left(\frac{1}{R_2} + \frac{1}{R_3}\right)^{-1} = \left(\frac{1}{10} + \frac{1}{20}\right)^{-1} = 6.7\Omega$

R_p is in series with R_1 so

$R_T = R_1 + R_p = 2 + 6.7 = 8.7\Omega$

② Find $I_T \Rightarrow I_T = \frac{V_T}{R_T} = \frac{12V}{8.7\Omega} = 1.4A$

$I_T = I_1$ b/c R_1 is in series

$V_1 = I_1 R_1 = (1.4A)(2.0\Omega)$
$= 2.8V$

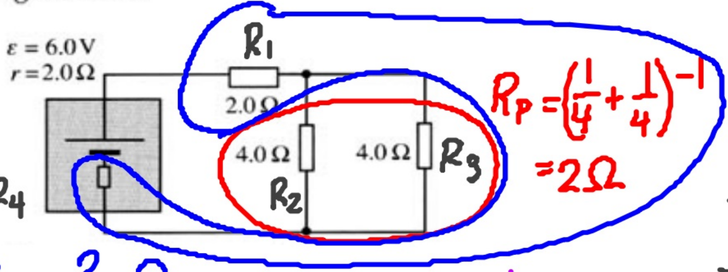
$V_2 = V_3$ b/c R_2 & R_3 are ||

so $V_2 = V_T - V_1 = 12 - 2.8$
$= 9.2V$

$I_2 = \frac{V_2}{R_2} = .92$

$I_3 = \frac{V_3}{R_3} =$

Find the current in, and potential difference across, each resistor in the circuits shown in Figure 5.28.



$R_P = \left(\frac{1}{4} + \frac{1}{4}\right)^{-1} = 2\Omega$

	V	I	R
R_1	2.0V	1.0A	2.0Ω
R_2	2.0V	.5A	4.0Ω
R_3	2.0	.5A	4.0Ω
R_4	2.0V	1.0A	2.0Ω
Total	6.0V	1.0A	6.0Ω

$R_T = \underline{?}\ \Omega$

$R_T = R_1 + R_4 + R_P$

$R_T = 6.0\Omega$

$I_T = \underline{?}\ A$

$I_T = \frac{V_T}{R_T} = \frac{6.0V}{6.0\Omega} = 1.0A$

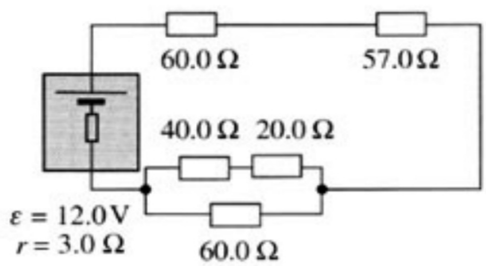
- B/c R_2 & R_3 are in parallel $V_2 = V_3$ so $V_2 = V_T - V_1 - V_4 = 2.0V$

$\therefore I_2 = \frac{V_2}{R_2} = .5A$

$I_3 = \frac{V_3}{R_3} = .5A$

- $I_T = I_1 = I_4$ b/c R_1 & R_4 are in series
- $V_1 = I_1 R_1 = 2.0V$
- $V_4 = I_4 R_4 = 2.0V$

Find the current in each of the resistors in the circuit shown in Figure 5.29. What is the total power dissipated in the circuit?



$R_T = 60.0 + 57.0 + (1/60.0 + 1/(40.0 + 20.0))^{-1} + 3.0$

$R_T = 150$ ohms

$P = (V^2)/R = (12.0\text{ V})^2/(150\text{ ohms}) = 0.96\text{ W}$