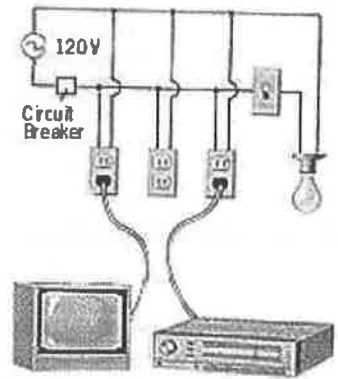
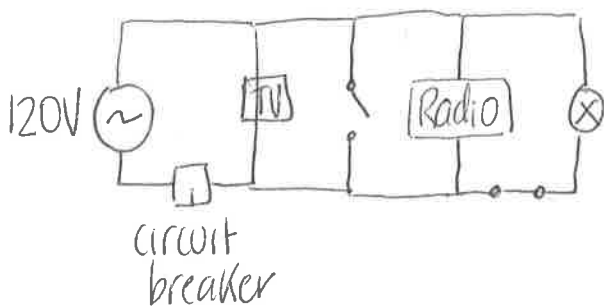


1. Is most household wiring in series or in parallel? Explain.

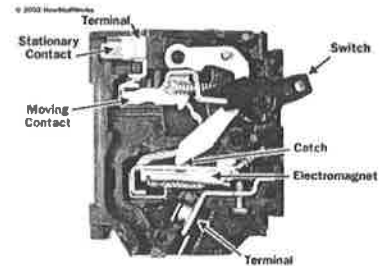
Parallel: If one light is turned off, the other lights stay on.



2. Draw an appropriate schematic for the household circuit shown.

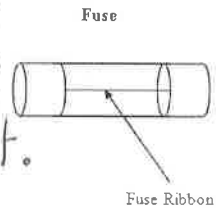


Circuit Breaker



3. What is the purpose of a fuse or a circuit breaker? How are they different?

A fuse and a circuit breaker are safety devices designed to prevent too much current from flowing through the system. Both can break/open the circuit. Fuses must be replaced. Breakers can be reset. Both stop the flow of current before a fire occurs.



4. A 900 watt toaster, a 640 watt waffle iron, and a 5 amp food processor are to be used on the same circuit. What size circuit breaker should be used?

$$\frac{900\text{W}}{120\text{V}} = 7.5\text{A} \quad P=IV \quad \frac{P}{V} = I \quad \text{assume } 120\text{V}$$

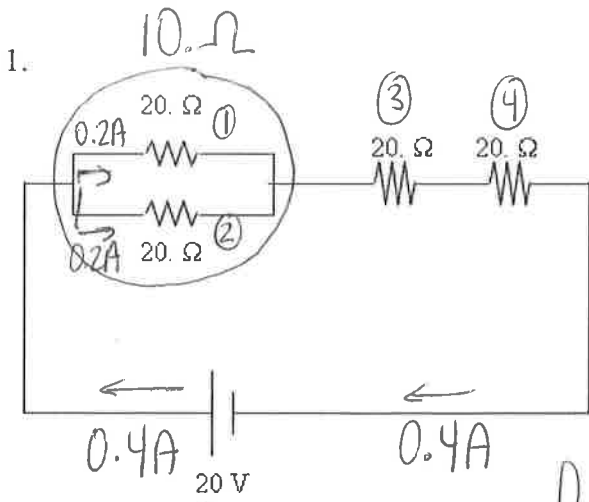
$$\frac{640\text{W}}{120\text{V}} = 5.3\text{A}$$

$$7.5\text{A} + 5.3\text{A} + 5\text{A} = 17.8\text{A}$$

minimum amperage tolerance needed for circuit breaker

# Combination Circuits

In each circuit below, determine the voltage drop across each resistor and the current through each resistor.

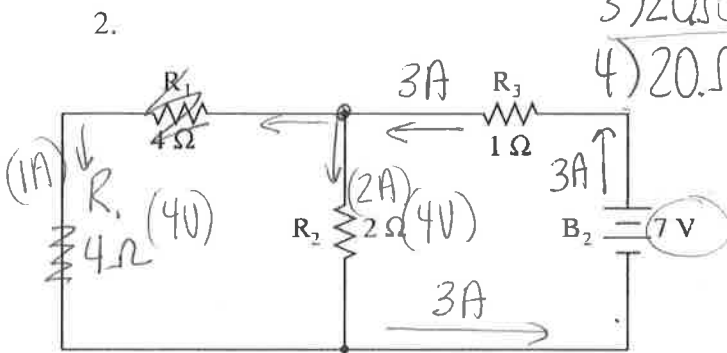
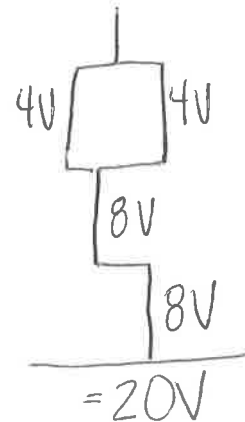


$$R_T = 50\Omega$$

$$V_T = 20V$$

$$I_T = \frac{20V}{50\Omega} = 0.4A$$

R	V	I
1) 20Ω	4V	0.2A
2) 20Ω	4V	0.2A
3) 20Ω	8V	0.4A
4) 20Ω	8V	0.4A

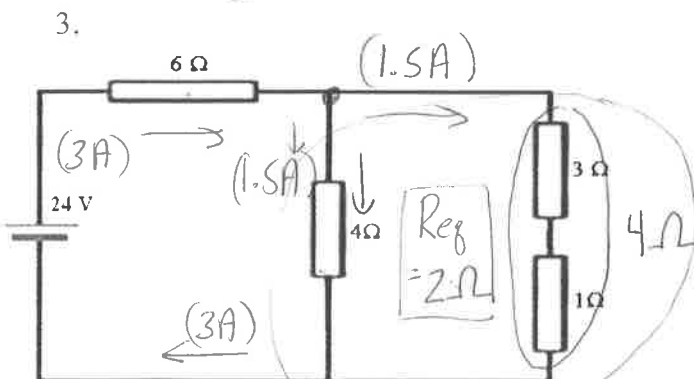


R	V	I
1Ω	3V	3A
2Ω	4V	2A
4Ω	4V	1A

$$V_T = 7V$$

$$R_{eq} = \left(\frac{1}{4\Omega} + \frac{1}{2\Omega}\right)^{-1} + 1\Omega = \frac{7}{3}\Omega$$

$$I_T = \frac{V_T}{R_T} = \frac{7V}{\frac{7}{3}\Omega} = 3A$$



R	V	I
6Ω	18V	3A
4Ω	6V	1.5A
3Ω	4.5V	1.5A
1Ω	1.5V	1.5A

$$R_{eq} = 6\Omega + 2\Omega = 8\Omega$$

$$V_T = 24V$$

$$I_T = \frac{24V}{8\Omega} = 3A$$