



# PLTW Engineering

# 10-12/Parallel Circuit Properties

April 21, 2020



10-12/DE

Lesson: **4/21/2020**

**Objective/Learning Target: Students will be able to identify a parallel circuit and explain the characteristics of a parallel circuit.**



## What is a parallel circuit?

Besides the series circuit that we looked at in the previous lesson, the other major type of a circuit is Parallel.

A parallel circuit is characterized by having the same voltage across every component.

When two components are connected in parallel, both ends of each component are directly connected together.



## What is a parallel circuit?

When every component in a circuit is directly connected across every other component in the circuit then the entire circuit is in Parallel.

Every component in a parallel circuit will have the same voltage across it and that will be the source voltage.



## Principles of a parallel circuit

All components will have the same voltage across them.

The total current is greater than any one branch current and we will see that as we look at our circuit calculations.



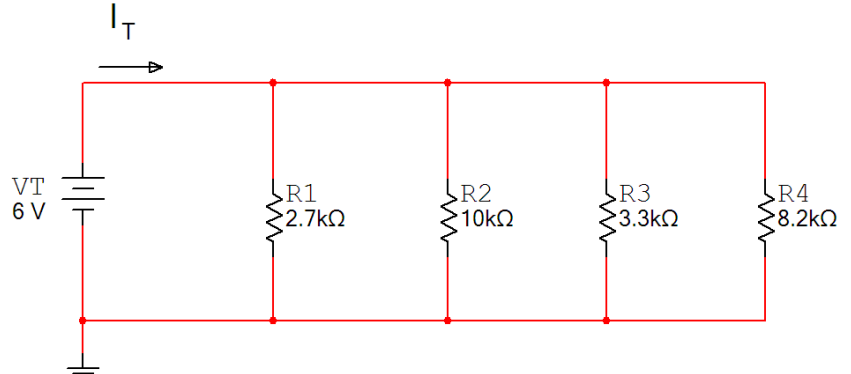
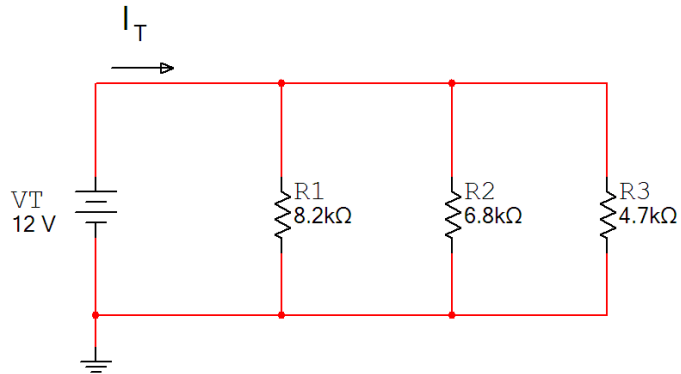
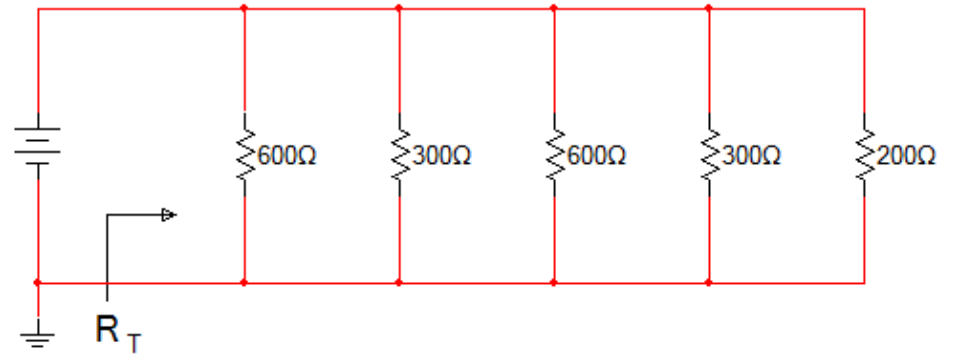
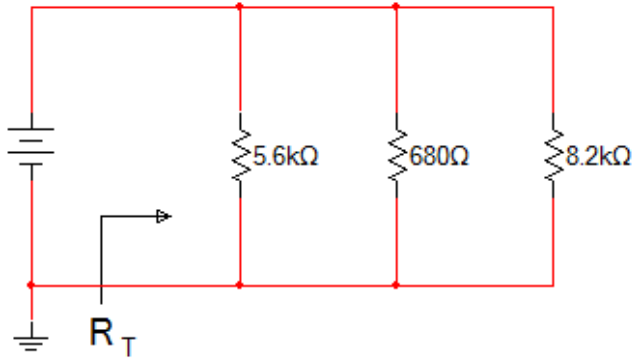
## Principles of a parallel circuit

The total resistance is less than any one branch resistance.

If there are multiple resistances in a parallel circuit you will find that the total resistance will be less than the very smallest resistance - so total resistance is less than any one branch resistance.

Total power is greater than any one component dissipation, so the total power is going to be the sum of all of the component power dissipations added together and that will be greater than any one single component dissipation.

# Schematics of a parallel circuit





## Quiz yourself - Series circuits

1. True or False - Parallel circuits have components that are connected together?
2. How many directions does the current flow in a parallel circuit?
3. True or false? - Each component in a parallel circuit contains the same current.
4. Does resistance effect current in a parallel circuit?
5. In a parallel circuit, are the voltages or currents divided?
6. In a parallel circuit, can total resistance is less than any one branch resistance? Why?





## Helpful Links

[Parallel Circuits and their uses](#)

[A science based view of parallel circuits](#)