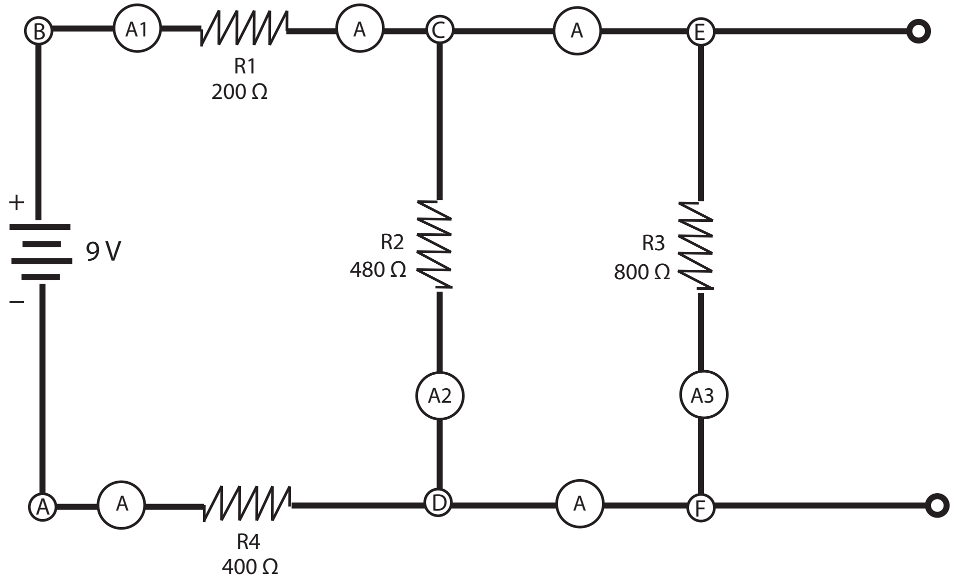
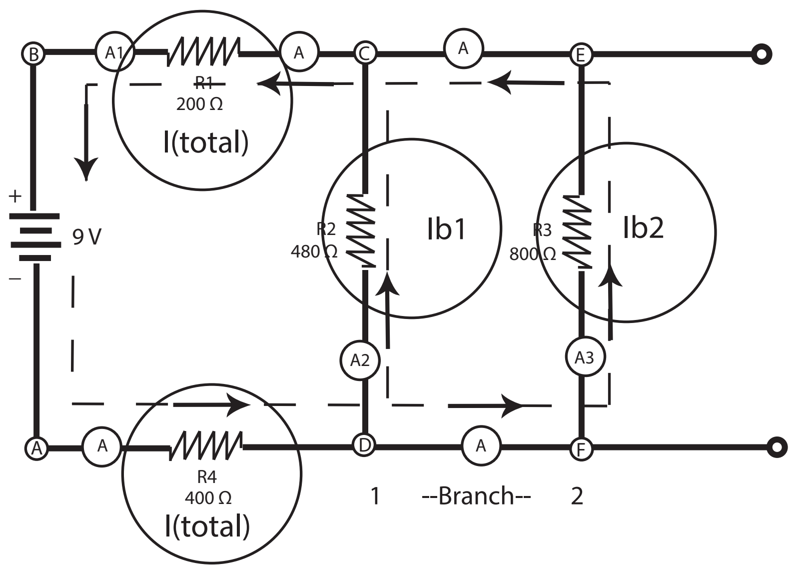
Steps in solving a Simple Series/parallel circuit --------------------------Page1





Think about the flow of electron (current) in the circuit it flows counter clockwise on this example.

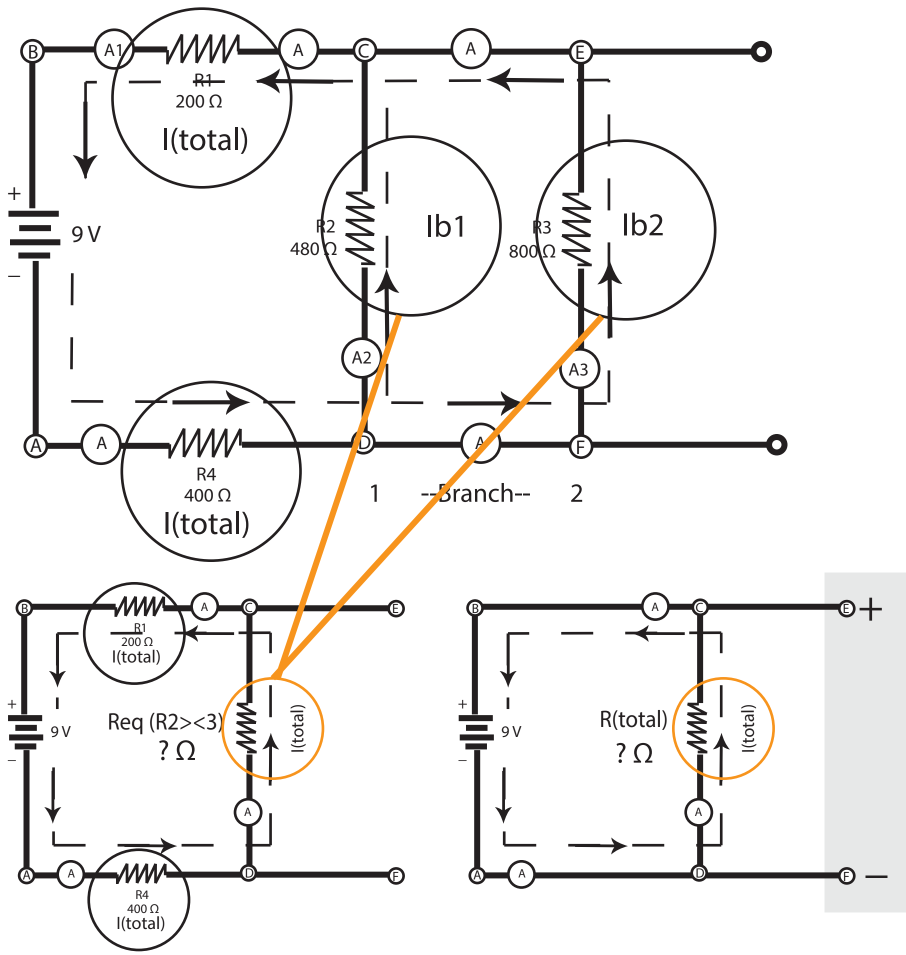
R4 has the full current because it is the only resistance directly connected to the negative terminal on the power source.

The current is divided creating two branches at R2 and R3 because they are attached to the negative side of R4 positive side of R1

R1 has the full current because it is the only resistance directly connected to the Positive terminal on our power source

Since we know the Voltage Supplied and the individual resistor values we must solve the voltage division before we can solve for current

Steps in solving a Simple Series/parallel circuit -------------------------Page2



Finding the equivalent resistance for current branches 1 and 2 we can think of current flow in a series

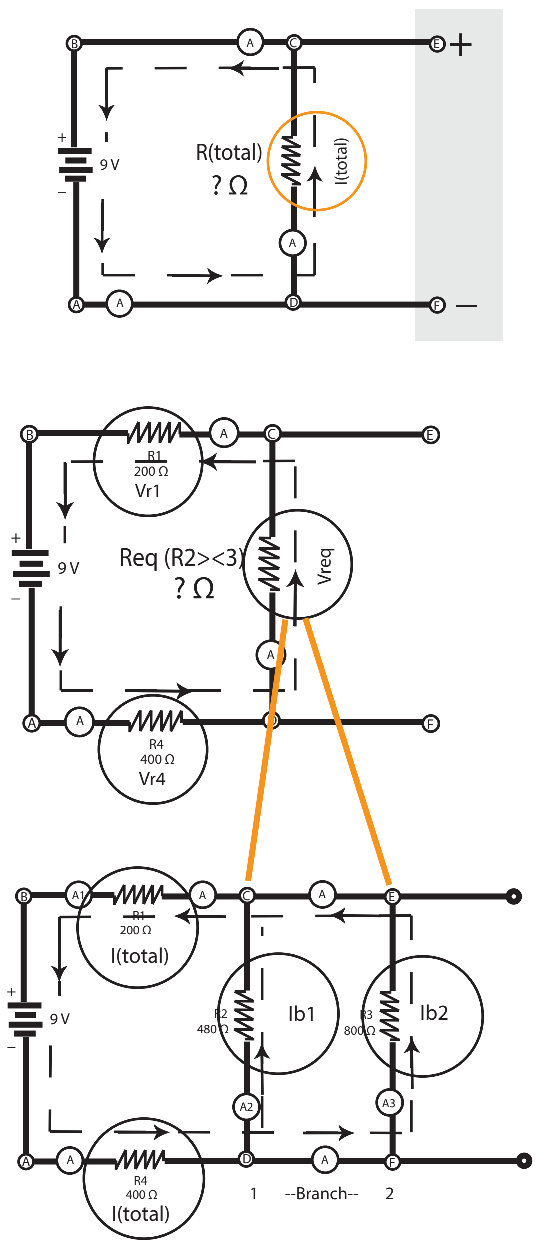
in this circuit the equation for finding Req will be
Req = R2 * R3 / R2 + R3   Do the math now.

With the value of Req we can find out what I(total) will be. (series arrangements of loads) This is important because we have reduced the circuit to one path of electron flow

In this circuit the equation would be:
R(total) = (r1 + Req + R4)   Do the math now

Note: in network theorem this simplified circuit can now be seen as a current source terminals with internal resistance. The terminals of the power source can now be seen as points (E and F) on our original circuit.

I(total) = Vs / R(total)   Do the math now



Expansion of the circuit

One you have found the value of I(total) You can now expand the circuit. Here we are trying to find out the value of the arrangement of resistance in a series arrangement. This will allow us to find the voltage of the branches.

In this example the equations are:

Vr1 = I(total) * R1 Do the math now

Vreq = I(total) * Req Do the math now

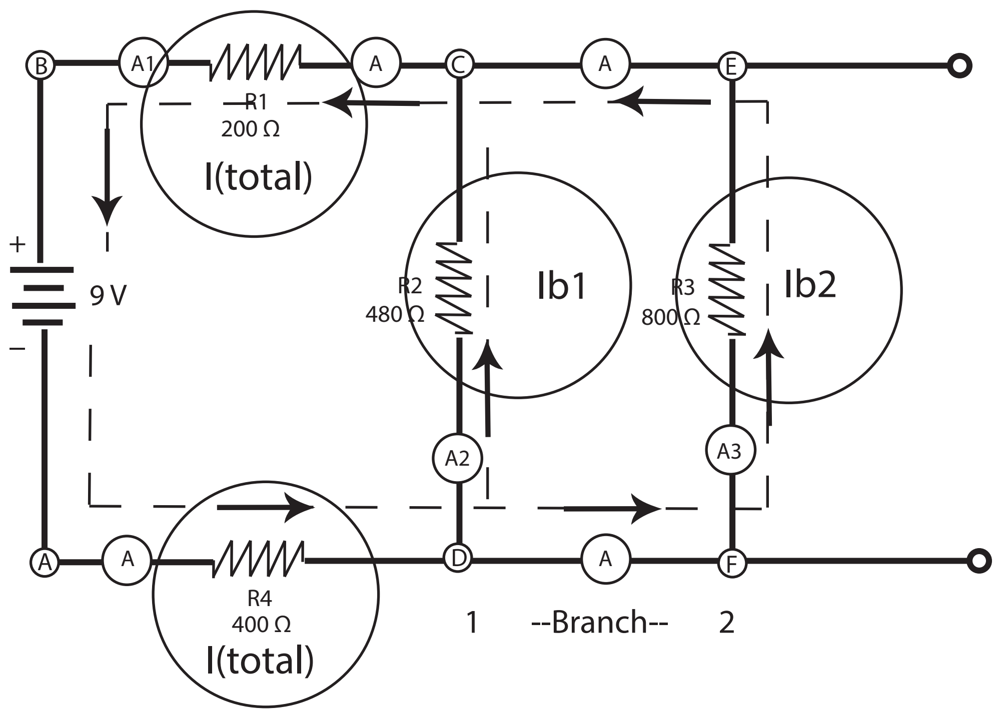
Vr4 = I(total) * R4 Do the math now

Now we can expand the circuit further. Since we know the Voltage of Vreq we know the value of voltage going through the branches of the circuit we can now use Ohms law to solve for Ib1 and I b2

In this example the equation are:

Ib1 = Vreq / R2 Do the math now

Ib2 = Vreq / R3 Do the math now



(A1) I(total) =

(A2) I(b1) =

(A3) I(b2) =

Vs =
R(total) =
Req =
Vr1 =
VR2 =
VR3 =
VR4 =
P(total) =
P1 =
P2 =
P3 =
P4 =

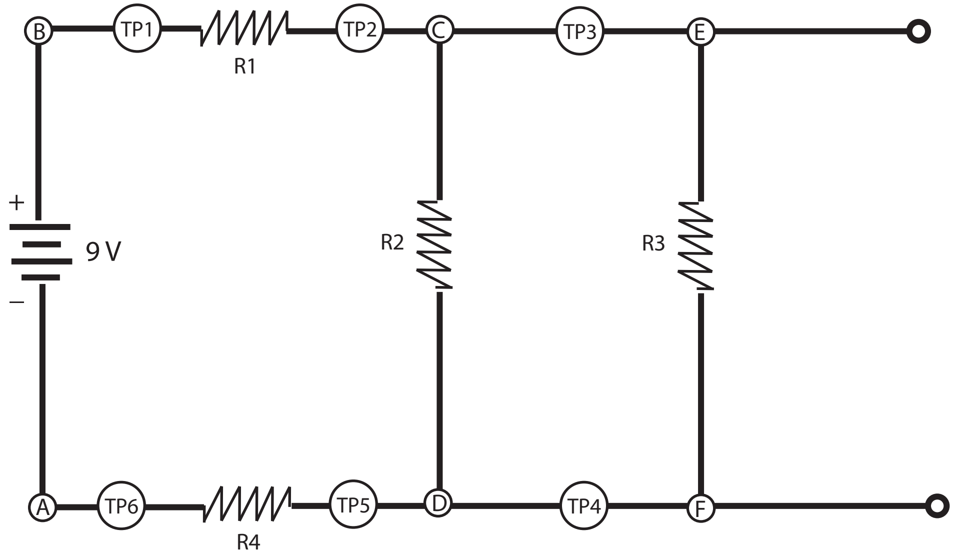
Now we can use other formulas to double-check our work

The currect split: Ib1 = (r3 / r2 + r3) * I(total)
Ib2 = (r2 / r2 + r3) * I(total)

Volatge over Resitors: Vr2 = Ib1 * R2
Vr3 = Ib2 * R3

The total voltage: Vs = Vr1+Vr2+Vr4

Simple Series/parallel on a Solderless Bread Board



Test Point