Booklet 14

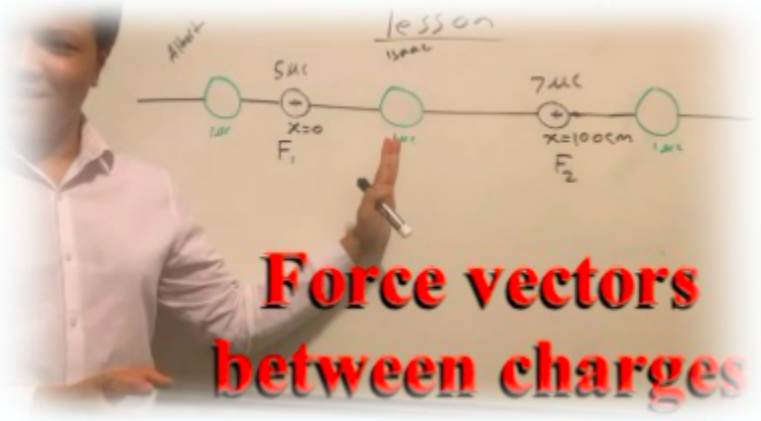
Physics Website 14

Topic | Complex Circuit

Flipped Classroom

Tutorial | **https://youtu.be/GWi1YHTOaqc**

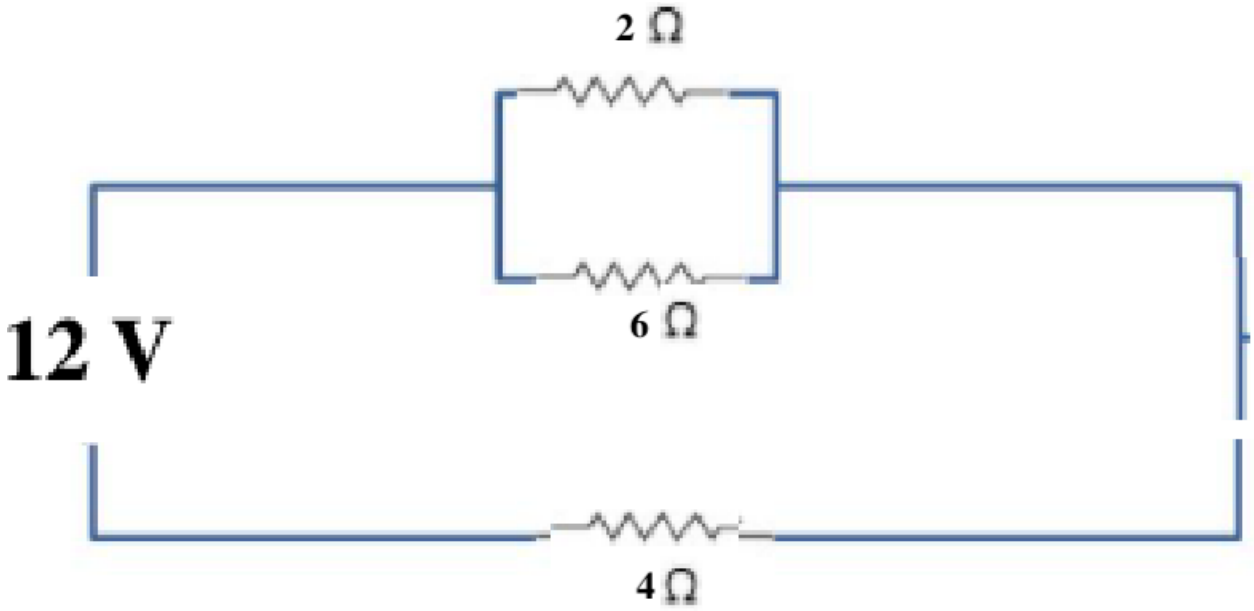
Problem : Use vector analysis to prove that Green charge in the middle will have zero net electric force.



Do Now

Problem : (a) Decompose the complex circuit below by turning it to a simple circuit in two steps. (b) Fill the table below. **Tutorial** | https://youtu.be/thTi_QrPuZ0

1.

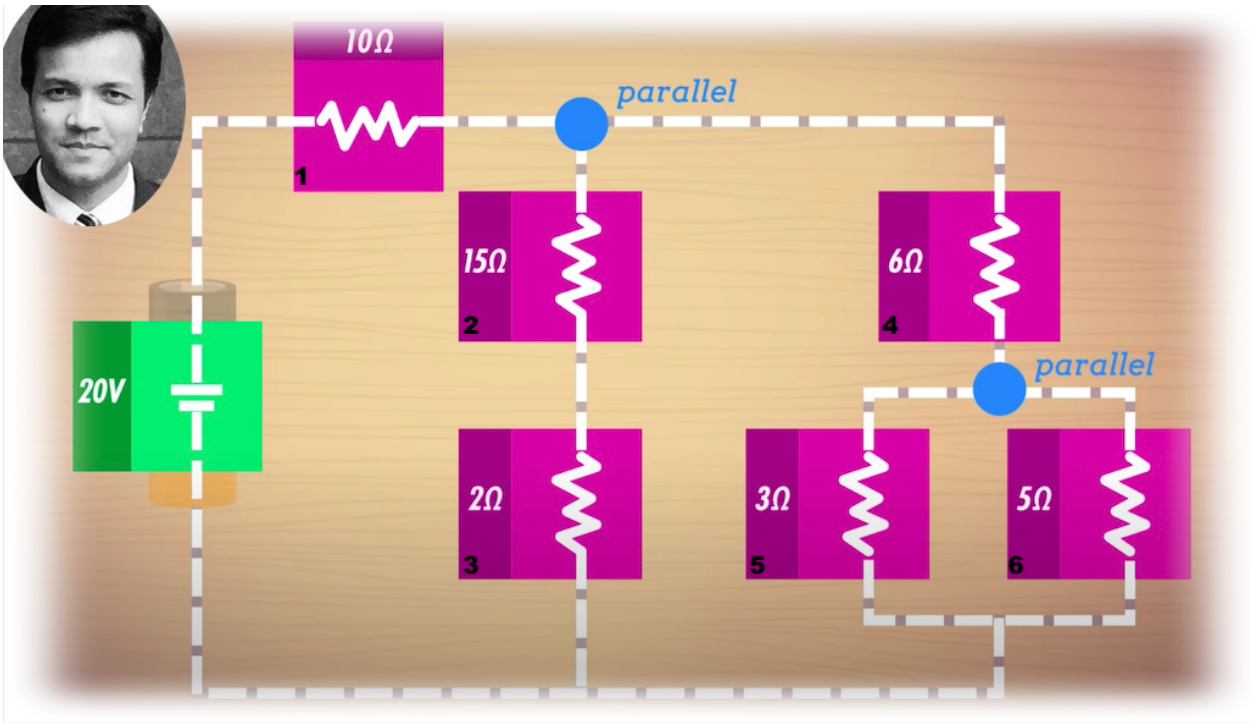


	V	I	R
Bulb 1			
Bulb 2			
Bulb 3			
Total			

Big Idea

Decompose the circuit below in four steps. Step 1 is Circuit 2 with four resistors, step 2 is circuit 3 with 3 resistors, step 3 is circuit 4 with 2 resistors and step 5 is circuit 5 with 1 resistor. Then walk backward to show voltage and current at each resistor. Finally, fill the table below.

Tutorial | https://youtu.be/aYuNazomvhs



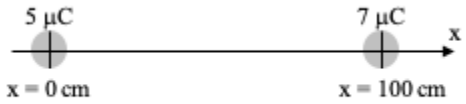
Fill the table below using the above Complex circuit. Watch the video tutorial as many times as needed.

Resistors	Resistance (R)	Current (I)	Voltage (V)
Resistor 1			
Resistor 2			

Resistor 3			
Resistor 4			
Resistor 5			
Resistor 6			
Total			

Exit Slip :

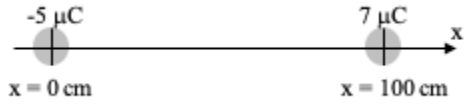
Tutorial | https://youtu.be/GWi1YHTOaqc



Two static charges are placed a distance 1 m apart. One has a charge of 5 μC, and the other has a charge of 7 μC. A charge placed anywhere near the two charges will feel the electrostatic force due to both of them. A static charge that feels no net force is said to be in equilibrium. Can you place a third charge q = 1 μC somewhere on the x-axis so that it feels no net force due to the other two? If so, in which region: somewhere to the left of the two charges, somewhere in the middle, or somewhere to the right of the two charges? What would happen if you instead placed a charge of –1 μC in that spot? Would it be in equilibrium or not?

Homework

Tutorial | https://youtu.be/CPjdwixY9Qk



What happens to the charge q from Exit Slip if you accidentally put it a little bit to the right or to the left of the equilibrium point discussed in Flipped Classroom? Does the charge try to return to the equilibrium point or not? (Hint: consider both a positive and a negative q. One of the charges is now replaced with a negative charge. (See the picture.) Could you now place a charge of q = 1 mC somewhere on the x-axis so that it feels no net force? If so, in which region: somewhere to the left of the two charges, somewhere in the middle, or somewhere to the right of the two charges? Calculate where to place the charge q from part 1 so that it feels no net force.