ADVANCED PHYSICS CLUB

APRIL 24, 2022

Useful resources

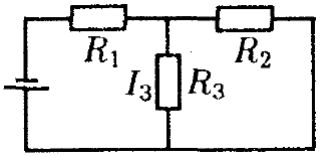
The updates, homework assignments, and useful links for APC can be found on SchoolNova's web page:
`https://schoolnova.org/nova/classinfo?class_id=adv_phy_club&sem_id=ay2021`
The practical information about the club and contacts can be found on the same web page.

Today's meeting

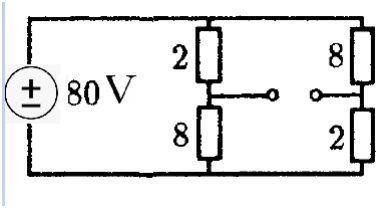
We continue the discussion about electricity and magnetism. The new assignment is about electric circuits. **Note that some of the notations in the circuits might differ from what you are used to.** In particular, throughout the assignment a resistor is denoted by a hollow rectangle.

Homework

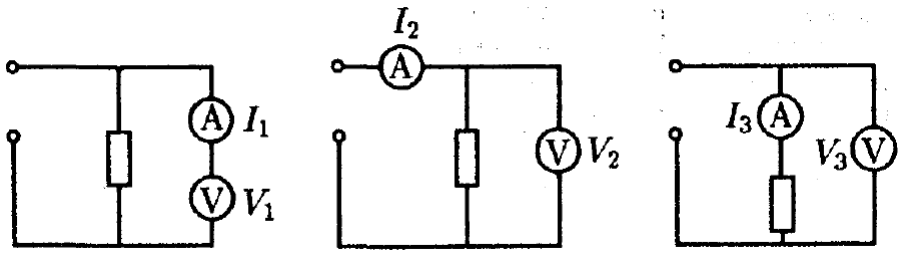
1. Resistances R_1, R_2 and R_3 in the circuit shown on the figure are known. The current I_3 flowing through R_3 is also known. Find the current through the other two resistors and the voltage supplied by the battery.



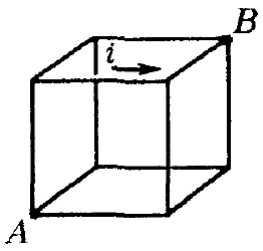
2. What is the potential difference between the two terminals in the circuit shown on the figure? What will be the reading of an ammeter plugged between these two terminals? Resistors have resistances shown next to them in Ohms.



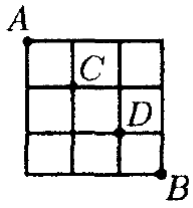
3. A resistor, an ammeter and a voltmeter are arranged in three different ways (shown on the figure below) and are connected to a voltage source which produces a different unknown voltage in every of the three cases. The readings of the ammeter an the voltmeter in each case are known and shown on the figure. Find resistances of the resistor, the ammeter and the voltmeter.



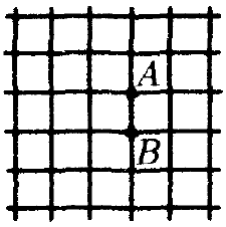
4. A cube is made out of wire. Every edge of the cube has the same resistance r. A battery is connected to point A and B shown on the figure. The current though one of the edges (shown on the figure) is i. Find the potential difference between A and B, the total resistance between points A and B and the total current between A and B.



5. Each side of a circuit shown on the figure has the same resistance r. Find the total resistance between the points A and B ; between the points C and D.



***6.** An infinite grid consists of square cells. Each side has the same resistance R. Current I is flowing into the node A from an external source, the same current is taken out the note B by the same external source. What is the current flowing through the side AB? What is the equivalent resistance measured between points A and B?



FOR THE NEXT MEETING

IMPORTANT: The next club's meeting is at 3:00pm, via Zoom, on Sunday, **May 1**.