

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=ay2024

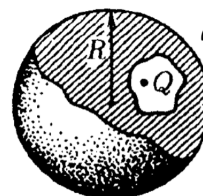
The practical information about the club and contacts can be found on the same web page.

TODAY'S MEETING

We started solving problems on electrostatic potential. The remaining problems are reassigned, the next topic is electric circuits.

REASSIGNED HOMEWORK

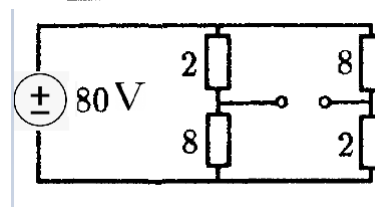
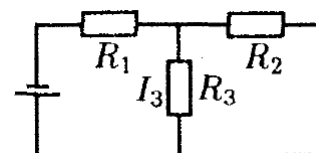
1. A solid metal ball of charge q has a cavity. A point charge Q is placed in this cavity. What total charge is induced on the surface of the cavity? What is the electric field outside the ball at distance L from its' center? Does it depend on the shape of the cavity or its' location in the ball?



2. Three concentric spheres made from conducting material have radii r , $2r$, $3r$ and charges q , $2q$ and $-3q$, respectively. Find the electrostatic potential of each sphere.
3. There are two concentric hollow metal spheres of radii R_1 and R_2 ($R_2 > R_1$). The outer sphere has charge q while the inner sphere is grounded. Find the electric field and electrostatic potential at every point as functions of the distance from the common center of the spheres.

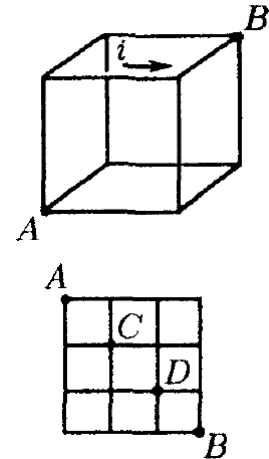
HOMEWORK

1. In the circuit shown on the figure, resistances R_1 , R_2 and R_3 are known. The current I_3 flowing through R_3 is also given. Determine the currents through the resistors R_1 and R_2 as well as the voltage supplied by the battery.
2. In the circuit shown in the figure, each resistor has a resistance value indicated next to it (in ohms). What is the potential difference between the two open terminals? If an ideal ammeter is connected between these terminals, what current will it register?



3. A wire is bent into a perfect circle and has a total resistance of 10 ohms. At which two points on the circle should an ohmmeter be connected so that it measures a resistance of exactly 1 ohm between those points?

4. A cube is constructed from wire, with each of its 12 edges having the same resistance r . A battery is connected across two vertices A and B , as shown on the figure. It is known that the current through one specific edge (marked in the figure) is i . Determine the following:
- The potential difference between points A and B
 - The equivalent resistance between points A and B
 - The total current flowing from A to B .
5. In the circuit shown in the figure, each side has the same resistance r . Determine the equivalent resistance a) between points A and B ; b) between points C and D .



FOR THE NEXT MEETING

IMPORTANT: The next club's meeting is at **2:30pm, in person**, on Sunday, April 27.