AP Physics C: Electricity and Magnetism

Electrostatics HW 2

Mr. Perkins

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Problem 1: The statement is false. They correctly identify that the neagtive charge "cancels" the positive charge; there is an equal amount of both. Using this information and the fact that the electron cloud is separate from the nucleus, the ectrons will attract to the positively charged object while the protons will repel. The electrons will be closer than the protoons, and by using Coulomb's Law, $F = \frac{kq_1q_2}{r^2}$, we can find that the force of the electrons will be greater than the force of the protons, as the charges are the same, but the electrons are closer. This means that the force of attraction will be greater than the force of repulsion, and the atom will be attracted to the charged object.
Problem 2: It is not the charge that attracts it. Rather, it is the force created by the electric field.
Problem 3: When Jack touched the tape, the electrons transferred to him, as he is grounded. This discharged the tape, which made the two tapes no longer repel.
Problem 4: Atom A is would experience a greater attraction to a point charge a distance r away, as the postiive charge becomes more separated from the negative charge, causing an increase of electric field in the direction of the point charge. This means that the force of attraction will be greater.
Problem 5: The statement is true. z
Problem 6: