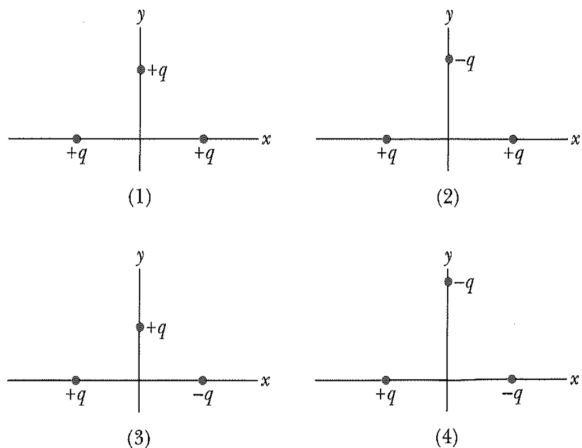


In-class problems, Wed Feb 12, 2020

21.1 Coulomb's law

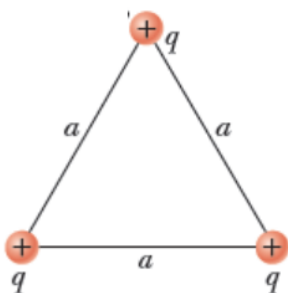
1. Calculate the net electrostatic force on object q_C
2. You're asked to calculate the electrostatic force on q_A . Your lab partner says, "That's easy. Using Newton's third law, it's the same magnitude as for q_C and in the opposite direction." Is your lab partner right? Explain. (No, don't calculate it.)
3. For each of the following, (a) draw a force diagram for the charge on the y-axis and (b) determine the magnitude and direction of the net electrostatic force on this charge. Do this graphically.



(Halliday Resnick Walker 11th ed)

4. Determine the magnitude of the net electrostatic force on any one of the charges below. Come up with an expression in terms of the given parameters (a , q , ...).

Use symmetry to cut your calculations in half. This is an equilateral triangle, so you know something about those angles.



(answer: $2kq^2 \cos 30^\circ / a^2$)

Due Th Feb 13, 2020, beginning of class

21.1 Coulomb's law

Read 21.1, just the sections on "electric charge" and "conductors and insulators" (p 610 - 613)

1. In the demonstrations, how do the plastic and glass rods get charged?
2. What is a conductor? an insulator? a semiconductor? a superconductor?
3. Give definitions for each of the following

electrically isolated
grounded
discharged
induced charge

Use words (4 sentences at the most) and maybe pictures. Your answer should address the behavior of charges in these materials. Give one example for each type of material, except the superconductor.