Quiz 1

An organ pipe that is open at one end and closed at the other sounds producing the fundamental standing wave and the next two harmonics. In the below sketchs of the organ pipe, draw each of these standing waves and report the frequency of the standing wave. Label a node and an antinode.

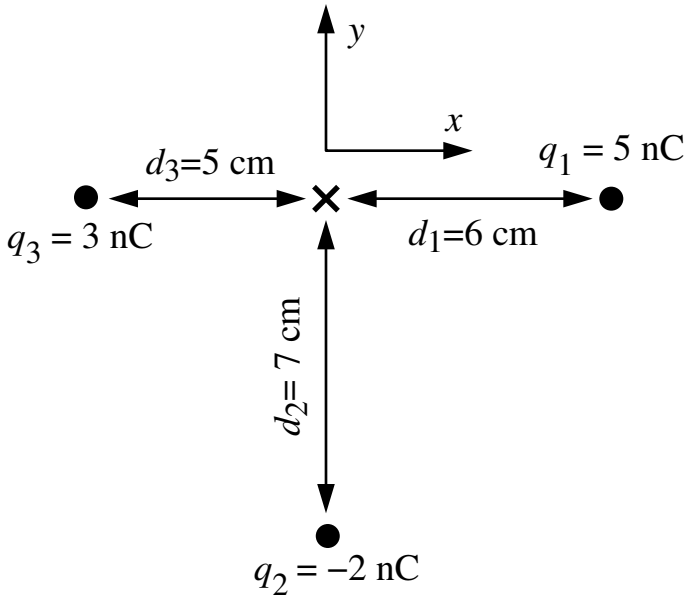fundamental frequency = 300 Hz
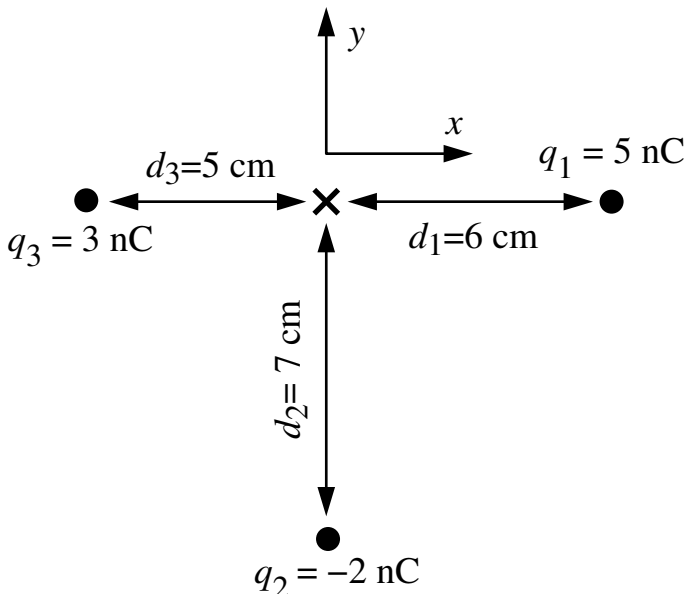
harmonic A frequency = Hz

harmonic B frequency = Hz

Quiz 2

Find the net electric field vector (i.e., report its x and y components) at the spot marked ✖ due to the three charges q_1, q_2, q_3 located as shown in the figure below. Directly on the drawing sketch in the approximate direction of the electric field vector due to each charge. Label the electric field due to q_1, E_1, etc. Sketch in the net electric field vector and label an angle showing its direction. Calculate and report the numerical value of that angle.

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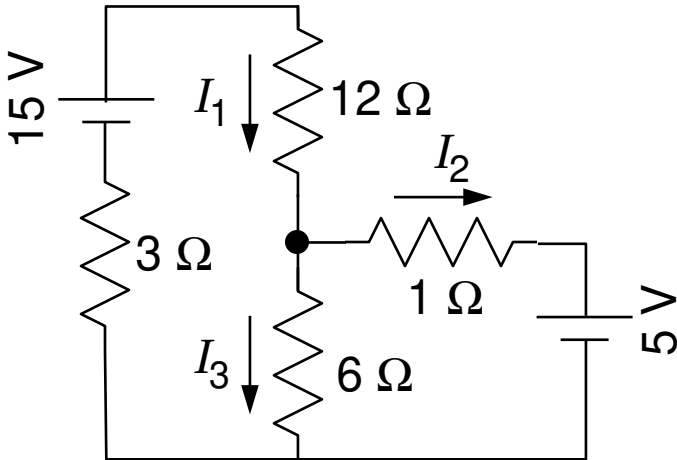
Quiz 3

Two identical uncharged capacitors are connected in parallel and then connected to a battery. Draw below the schematic diagram of this circuit. The battery transfers a charge Q to this parallel combination. For each of the four plates that make up the two capacitors report (i.e., label the plate with) the charge on that plate. If the battery produces a voltage V, report the voltage across each capacitor.

Two identical uncharged capacitors are connected in series and then connected to a battery. Draw below the schematic diagram of this circuit. The battery transfers a charge Q to this series combination. For each of the four plates that make up the two capacitors report (i.e., label the plate with) the charge on that plate. If the battery produces a voltage V, report the voltage across each capacitor.

Quiz 4

Directly on the below circuit diagram draw and label two loops. Write down (and label) the Kirchhoff loop equation for each of your two loops. For the junction displayed below as ● write down the Kirchhoff junction equation using the displayed names/directions. Record the matrix you would enter to solve the resulting equations using `rref`. (For this quiz you need NOT solve the the resulting matrix problem.)

15 V

I_1 12 Ω

I_2

3 Ω

1 Ω

5 V

I_3 6 Ω

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