

Name: _____

Class Period: _____

Physics: Electric Fields and Electric Potential

Using a Test Charge - Homework

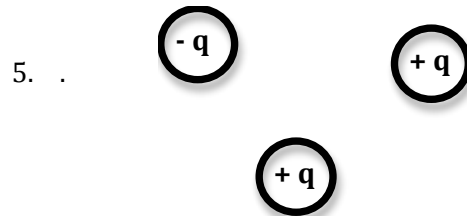
Mass of a proton = 1.67×10^{-27} kg

Mass of an electron = 9.11×10^{-31} kg

Conceptual Questions:

1. When testing the strength of an electric field, why should the test charge used have only a small amount of electrical charge itself?
2. **Circle One:** A positive test charge moves with/against the electric field lines
3. **Circle One:** A negative test charge moves with/against the electric field lines

Sketch: Draw the electric field lines from the configurations of charges shown below



Calculating the Electric Field using Test Charges:

6. A proton is placed in an electric field $E = 520$ N/C directed downwards. What is the magnitude and direction of the force felt by this proton?
7. An electron experiences an electric force of 3.2×10^{-14} N upwards. What is the magnitude and direction of the electric field at the electron's location?

8. A proton is placed in a uniform electric field with a strength of 3500 N/C directed to the east.
 - A. What is the magnitude and direction of the electric force exerted on the proton from the electric field?
 - B. Using the force from part A, what is the acceleration of the proton?
 - C. Using your kinematics and the acceleration found in part B, if the proton begins from rest when it was placed in the electric field, what will its velocity be after 2.0×10^{-9} s?