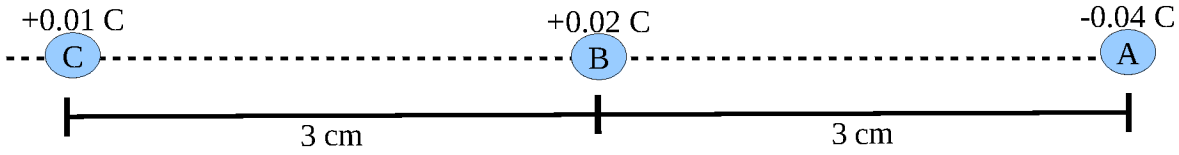
Name: 08/28/13

Quiz #1: Electrostatics – Forces and Fields




1. Three point charges are arranged in a line, as shown in the diagram. What is the force felt by charge A due to charges B and C?
   a) $8 \times 10^{9}$ N to the left
   b) $7 \times 10^{9}$ N to the left
   c) $1 \times 10^{9}$ N to the right
   d) $1 \times 10^{10}$ N to the right
   e) 0 N

2. What is the direction of the electric field at point B dues to charges A and C?
   a) ← b) ↑ c) → d) ↓ e) ↘

3. A charge of -1 μC is placed at x=0. How far away would a proton need to be in order to feel no force due to this charge?
   a) $1.6 \times 10^{-19}$ m
   b) $1.44 \times 10^{-16}$ m
   c) $1 \times 10^{-6}$ m
   d) $3.2 \times 10^{7}$ m
   e) ∞

4. A charge of -4 μC is placed in an isolated environment. What is magnitude of the electric field 3 cm from the charge?
   a) $4 \times 10^{7}$ N/C
   b) $1.2 \times 10^{6}$ N/C
   c) $3 \times 10^{3}$ N/C
   d) $1.66 \times 10^{-4}$ N/C
   e) None of the Above

5. Electrostatics is the study of -
   a) moving charges
   b) non-moving charges
   c) changing magnetic fields
   d) non-changing magnetic fields
   e) friction on non-moving objects

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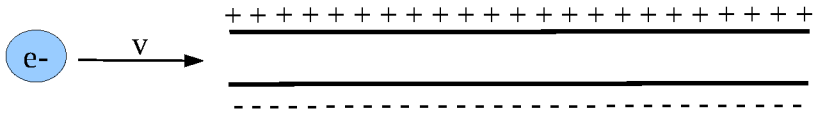
Questions 6-8 refer to the following diagram:




Two metal plates are separated by a distance of 2 cm, as shown in the diagram. The top plate has a positive charge, and the bottom plate has a negative charge. An electron is traveling parallel to the plates.

6. What is the direction of the electric field in the center of the gap, between the plates? (you may ignore any effects due to the electron)
   a) ← b) ↑ c) → d) ↓ e) ↘

7. What is the direction of the force on the electron when it passes between the two metal plates?
   a) ← b) ↑ c) → d) ↓ e) ↘

8. Which of these trajectories will the electron most likely follow?
   a) 
   b) 
   c) 
   d) 
   e) 

9. The electric field has a strength of 2000 N/C. What is the magnitude of the force on the electron?
   a) $8 \times 10^{-20}$ N
   b) $3.2 \times 10^{-16}$ N
   c) $2 \times 10^{3}$ N
   d) $7.2 \times 10^{11}$ N
   e) There is not enough information to solve this problem.

10. What is the best science?
    a) Chemistry
    b) Astronomy
    c) Physics
    d) Biology
    e) Environmental Systems