

Phys 132 - Fundamentals of Physics 2
Homework 3

Name: _____
Due Wed, Jan 24, 2007

Print out this homework assignment. Complete each of the following problems and circle the letter of the correct answer. For those problems that involve math, show all your work NEATLY. Use complete equations, no scribbles.

Reading Assignment: Please read Sections 18.8 and 18.9. You should have already read Sections 18.1 through 18.7.

1. True or false: It is possible to place a non-zero charge Q in a non-zero electric field \mathbf{E} and still have no electric force \mathbf{F} on the charge.
 - A) True
 - B) False

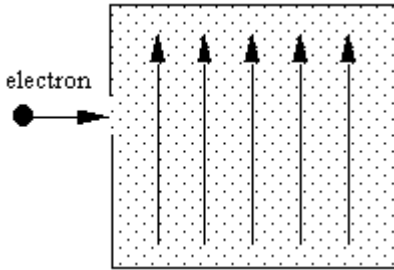
2. The **Electric Field** is...
 - A) Just another way of describing the Coulomb force.
 - B) The Coulomb force *per unit charge* that would be exerted on a charge in the field.
 - C) oriented in the direction that a charge is moving.
 - D) equal to the size of the charges causing the field.

3. As you get closer to a point charge, the strength (i.e. magnitude) of the Electric Field...
 - A) Stays the same.
 - B) Gets weaker.
 - C) Gets stronger.

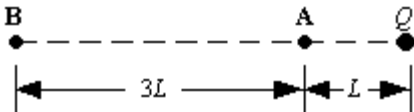
4. Which one of the following statements is true concerning the strength of the electric field between two oppositely charged parallel plates?
 - A) It is zero midway between the plates.
 - B) It is a maximum midway between the plates.
 - C) It is a maximum near the positively charged plate.
 - D) It is a maximum near the negatively charged plate.
 - E) It is constant between the plates except near the edges.

5. In an electric field of 520 N/C , a point charge of 2.3 mC would experience a force of:
- A) 1.2 N
 - B) 1200 N
 - C) $2.26 \times 10^6 \text{ N}$
 - D) 230 N

6. An electron traveling horizontally enters a region where a uniform electric field is directed upward. What is the direction of the force exerted on the electron once it has entered the field?



- A) to the left
 - B) to the right
 - C) upward
 - D) downward
 - E) out of the page, toward the reader
7. In the figure, point **B** is four times further from the charge **Q** than point **A**. What is the ratio of the electric field at **B** to that at **A**, E_B/E_A ?



- A) $1/16$
- B) 16
- C) $1/4$
- D) 4
- E) This cannot be determined since neither the value of Q nor the length L is specified.

8. Two charges are placed on the x axis. One charge ($q_1 = +8.5 \mu\text{C}$) is at $x_1 = +3.0$ cm and the other ($q_2 = -21 \mu\text{C}$) is at $x_2 = +9.0$ cm. Find the net electric field (magnitude and direction) at the requested positions. (Not multiple choice.) Show your work below.

(a) At $x = 0$ cm, $E =$ _____ to the _____.

(b) At $x = +6.0$ cm, $E =$ _____ to the _____.