Physics 1214, Homework #1 (due 8/29)

Multiple choice questions

M1 Four charges are located at the corners of a square as shown below. What is the direction of electric field in the center of the square? Write the letter of the arrow parallel to the field direction or 0 if you believe that the field is zero.

(1) Field direction: ____

(2) Field direction: ____

M2 Two charges of opposite sign are separated by a distance of 1 cm. If the distance between the charges is increased to 2 cm, the force between the charges

A. increases by a factor of 4
B. increases by a factor of 2
C. does not change
D. decreases by a factor of 2
E. decreases by a factor of 4
Problems

P1 Calculate the magnitude of the force between two 9 $\mu$C charges 3 cm apart.

P2 Three positive particles of charges 1 $\mu$C, 2 $\mu$C, and 3 $\mu$C, are located at the corners of an equilateral triangle of side 1 cm. Calculate the magnitude and direction of the net force on each particle.

P3 Two positive charges are separated by a distance of 12 cm. At a point on the line joining them, at a distance of 3 cm from the first charge, the electric field is zero. If the first charge has a magnitude of 2 $\mu$C, what is the magnitude of the second charge?

P4 Consider a system of two positive electric charges 1 $\mu$C and 4 $\mu$C placed at a distance of 10 cm. Where one has to place a probe charge such that the net force acting on it is zero?