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INSTRUCTOR

Chapter 17 (Homework)

Joel DeWitt
East Carolina University

Current Score

QUESTION

1

2

3

4

5

6

7

8

9

POINTS

1/1

3/4

0/3

2/2

1/1

1/4

2/4

0/1

1/1



TOTAL SCORE

11/21

52.4%

Due Date

TUE, OCT 13, 2020

11:50 PM EDT

11:59 PM EDT



Request Extension

Description**Assignment Submission & Scoring****Assignment Submission**

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

Your last submission is used for your score.

1. [1/1 Points]

DETAILS

PREVIOUS ANSWERS

COLFUNPHYS1 17.P.005.

MY NOTES

ASK YOUR TEACHER

Find the ratio of the magnitudes of the electrical and the gravitational forces acting between a proton and an electron separated by an arbitrary distance d .



2. [3/4 Points]

DETAILS

PREVIOUS ANSWERS

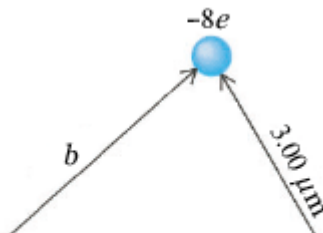
COLFUNPHYS1 17.P.009.

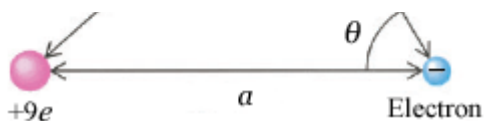
MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

An electron is near a positive ion of charge $+9e$ and a negative ion of charge $-8e$ (see the figure below). (Take $a = 4.30 \mu\text{m}$, $b = 3.84 \mu\text{m}$, and $\theta = 60.4^\circ$.)





(a) Find the magnitude and direction of the resultant force on the electron. (Let right be the $+x$ -direction. Measure the angle counter-clockwise from the $+x$ -axis.)

magnitude ✓

direction ✓ °

(b) Find the magnitude and direction of the electron's instantaneous acceleration (Let right be the $+x$ -direction. Measure the angle counter-clockwise from the $+x$ -axis.)

magnitude ✗

direction ✓ °

3. [0/3 Points]

DETAILS

PREVIOUS ANSWERS

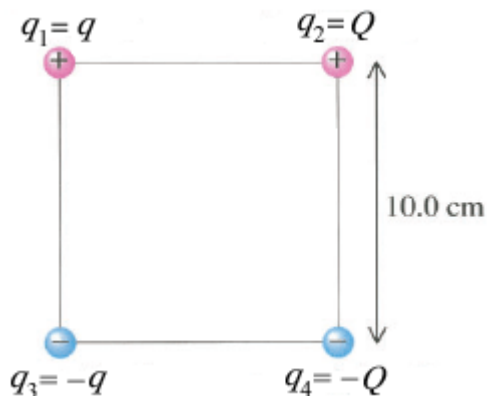
COLFUNPHYS1 17.P.010.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

Consider the following figure. (The four charges are at the corners of a square. Take $q = 1.10 \mu\text{C}$ and $Q = 1.98 \mu\text{C}$.)



(a) In the figure, what are the magnitude and direction of the resultant force on q_1 ? (Take q_1 as the origin of the coordinate system and measure the angle counterclockwise from the positive x -axis, which is directed towards the right.)

magnitude ✗

direction ✗ °

(b) What is the resultant force on the center of mass of the four charges?

 0

4. [2/2 Points]

DETAILS

PREVIOUS ANSWERS

COLFUNPHYS1 17.P.017.

MY NOTES

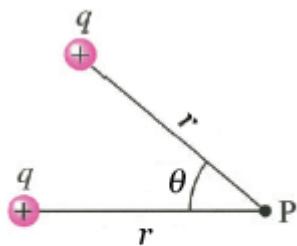
ASK YOUR TEACHER

PRACTICE ANOTHER

Find the electric field at P in the figure shown below. (Take $r = 1.1$ m and $\theta = 39^\circ$. Measure the angle counterclockwise from the positive x-axis.)

magnitude 1.557 N/C ✓

direction 340.5 ✓ °



$$q = \frac{1}{9.0} \times 10^{-9} \text{ C}$$

5. [1/1 Points]

DETAILS

PREVIOUS ANSWERS

COLFUNPHYS1 17.P.019.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

Points A, B, and C are at the vertices of an equilateral triangle. A certain positive charge q placed at A produces an electric field of magnitude 596 N/C at C. Suppose a second, identical charge is placed at B. What is the magnitude of the new electric field at C?

1032.3 N/C



6. [1/4 Points]

DETAILS

PREVIOUS ANSWERS

COLFUNPHYS1 17.P.021.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

A 1.92×10^{-9} C charge has coordinates $x = 0$, $y = -2.00$; a 2.76×10^{-9} C charge has coordinates $x = 3.00$, $y = 0$; and a -4.60×10^{-9} C charge has coordinates $x = 3.00$, $y = 4.00$, where all distances are in cm. Determine magnitude and direction for the electric field at the origin and the instantaneous acceleration of a proton placed at the origin.

(a) Determine the magnitude and direction for the electric field at the origin (measure the angle counterclockwise from the positive x-axis).

magnitude 6.449e4 N/C



direction 72.62



°

(b) Determine the magnitude and direction for the instantaneous acceleration of a proton placed at the origin (measure the angle counterclockwise from the positive x-axis).

magnitude 6.17e12 m/s^2



direction 107.38



°

7. [2/4 Points]

DETAILS

PREVIOUS ANSWERS

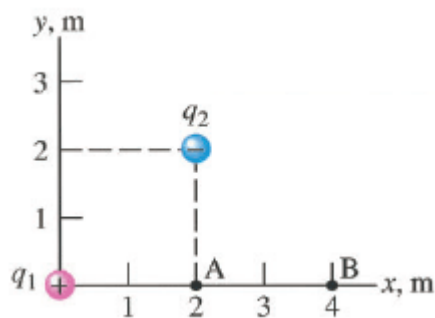
COLFUNPHYS1 17.P.023.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

Find the x and y components of the electric field produced by q_1 and q_2 in the figure shown below at point A and point B. (Take $q_1 = 1.95 \mu\text{C}$ and $q_2 = -1.21 \mu\text{C}$.)



Point A

$$E_x = 4.39\text{e3 N/C} \quad \checkmark$$

$$E_y = 2.72\text{e3 N/C} \quad \checkmark$$

Point B

$$E_x = -120.72 \text{ N/C} \quad \times$$

$$E_y = 608.66 \text{ N/C} \quad \times$$

8. [0/1 Points]

DETAILS

PREVIOUS ANSWERS

COLFUNPHYS1 17.P.026.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

Millikan measured the electron's charge by observing tiny charged oil drops in an electric field. Each drop had a charge imbalance of only a few electrons. The strength of the electric field was adjusted so that the electric and gravitational forces on a drop would balance and the drop would be suspended in air. In this way the charge on the drop could be calculated. The charge was always found to be a small multiple of 1.6×10^{-19} C. Find the charge on an oil drop weighing 2.18×10^{-14} N and suspended in a downward field of magnitude 2.73×10^4 N/C.

  e

9. [1/1 Points]

DETAILS

PREVIOUS ANSWERS

COLFUNPHYS1 17.P.028.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

During a thunderstorm the electric field at a certain point in the earth's atmosphere is 1.04×10^5 N/C, directed upward. Find the acceleration of a small piece of ice of mass 1.05×10^{-4} g, carrying a charge of 1.04×10^{-11} C.

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