CENGAGE | WEBASSIGN

yathartha.regmi@ttu.edu
(Sign out)

← PHYS 2401, section 201, Summer 2 2022

Coulomb's Law and Electric Fields (Homework)

INSTRUCTOR
Keith West
Texas Tech University

Current Score

QUESTION	1	2	3	4	5	6	7
POINTS	–/2	–/2	–/2	–/4	–/2	–/2	–/5

TOTAL SCORE

–/19	0.0%

Due Date

THU, AUG 4, 2022
11:58 PM CDT

Request Extension

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. **[–/2 Points]** DETAILS **SERPSE10 22.3.OP.003.**

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

Two charged particles, q_1 and q_2, are located on the x-axis, with q_1 at the origin and q_2 initially at x_1 = 14.6 mm. In this configuration, q_1 exerts a repulsive force of 2.62 μN on q_2. Particle q_2 is then moved to x_2 = 17.6 mm. What is the force (magnitude and direction) that q_2 exerts on q_1 at this new location? (Give the magnitude in μN.)

magnitude [ ] μN

direction ---Select---

Need Help? Read It

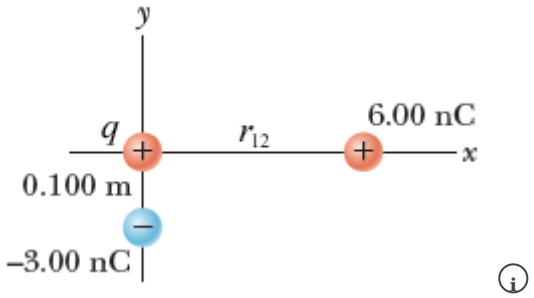
2. [–/2 Points] DETAILS SERPSE10 22.3.OP.007.MI.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

Three point charges are arranged as shown in the figure below. Find the magnitude and direction of the electric force on the particle q = 4.94 nC at the origin. (Let r_{12} = 0.280 m.)

magnitude [ ] N

direction [ ] ° counterclockwise from the $+x$ axis



Need Help? Read It Master It

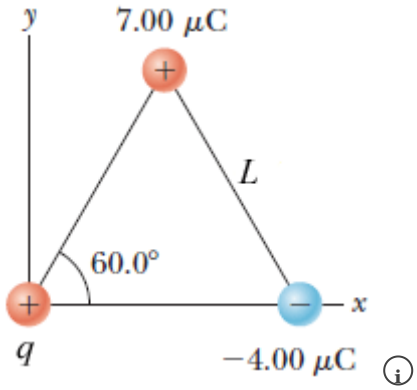
3. [–/2 Points] DETAILS SERPSE10 22.3.OP.008.MI.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

Three charged particles are located at the corners of an equilateral triangle as shown in the figure below (let q = 2.20 µC, and L = 0.730 m). Calculate the total electric force on the 7.00-µC charge.

magnitude [ ] N

direction [ ] ° (counterclockwise from the +x axis)



Need Help? Read It Master It

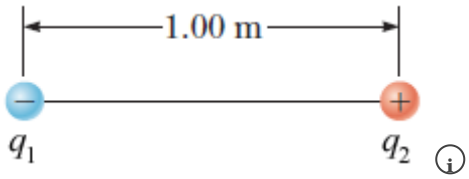
4. [–/4 Points] DETAILS SERPSE10 22.4.OP.015.MI.SA.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

This question has several parts that must be completed sequentially. If you skip a part of the question, you will not receive any points for the skipped part, and you will not be able to come back to the skipped part.

Tutorial Exercise

In the figure below, determine the point (other than infinity) at which the electric field is zero. (Let q_1 = -2.55 μC and q_2 = 6.90 μC.)

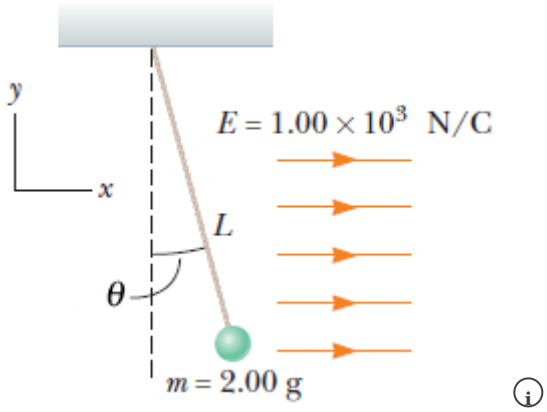


Need Help? Read It

5. [–/2 Points] DETAILS SERPSE10 22.4.OP.017.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

(a) A sphere is attached to a string of length L = 15.0 cm and suspended from the ceiling, as shown in the figure. A uniform electric field points to the right in the figure. When θ = 13.2°, the sphere is in equilibrium. Find the net charge on the sphere (in μC).



[ ] μC

(b) **What If?** If the electric field is suddenly turned off, what is the speed of the sphere at the bottom of its swing (in m/s)?

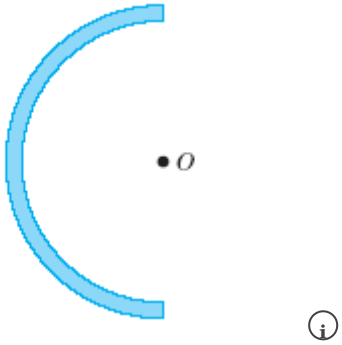
[ ] m/s

Need Help? Read It

6. [–/2 Points] DETAILS SERPSE10 23.1.OP.003.MI.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

A uniformly charged insulating rod of length 18.0 cm is bent into the shape of a semicircle as shown in the figure below. The rod has a total charge of −7.50 μC.



(a) Find the magnitude of the electric field (in N/C) at *O*, the center of the semicircle.

[ ] N/C

(b) Find the direction of the electric field at *O*, the center of the semicircle.

- ○ to the left
- ○ to the right
- ○ upward
- ○ downward
- ○ into the page
- ○ out of the page

(c) **What if?** What would be the magnitude of the electric field (in N/C) at *O* if the top half of the semicircle carried a total charge of −7.50 μC and the bottom half, insulated from the top half, carried a total charge of +7.50 μC?

[ ] N/C

(d) What would be the direction of the electric field at *O* if the top half of the semicircle carried a total charge of −7.50 μC and the bottom half, insulated from the top half, carried a total charge of +7.50 μC?

- ○ to the left
- ○ to the right
- ○ upward
- ○ downward
- ○ into the page

○ out of the page

Need Help? Read It Master It

---

7. [–/5 Points] DETAILS SERPSE10 22.6.OP.019.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

A proton is projected in the positive x direction into a region of uniform electric field $\vec{\mathbf{E}} = (-6.50 \times 10^5)\,\hat{\mathbf{i}}$ N/C at $t = 0$. The proton travels 7.90 cm as it comes to rest.

(a) Determine the acceleration of the proton.

magnitude _____ m/s^2

direction ---Select---

(b) Determine the initial speed of the proton.

magnitude _____ m/s

direction ---Select---

(c) Determine the time interval over which the proton comes to rest.

_____ s

Need Help? Read It Watch It

Submit Assignment Save Assignment Progress

Home My Assignments Request Extension