CENGAGE | WEBASSIGN

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(sign out)

Homework Problem Set 02 (Homework)

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Current Score

QUESTION	1	2	3	4	5	6	7	8	9	10	11
POINTS	10/10 ✓	10/10 ✓	10/10 ✓	10/10 ✓	10/10 ✓	10/10 ✓	10/10 ✓	10/10 ✓	10/10 ✓	10/10 ✓	10/10 ✓

TOTAL SCORE

110/110	100.0%

Due Date Past Due

FRI, FEB 7, 2020
11:59 PM CST

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.

The due date for this assignment has passed.

Your work can be viewed below, but no changes can be made.

Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may not grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

Request Extension | View Key

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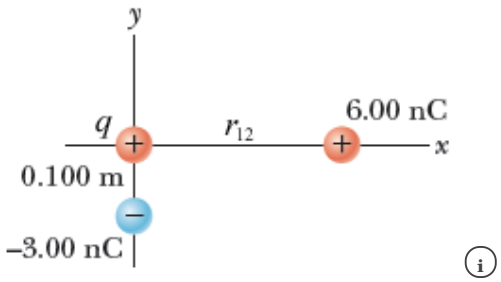
1. 10/10 points Previous Answers SerPSE10 22.3.OP.007.MI.

My Notes Ask Your Teacher

Three point charges are arranged as shown in the figure below. Find the magnitude and direction of the electric force on the particle q = 5.24 nC at the origin. (Let r_{12} = 0.325 m.)

magnitude 0.0000144 ✓ N

direction 259.28 ✓ ° counterclockwise from the $+x$ axis



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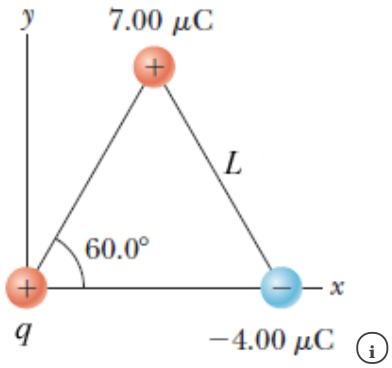
2. 10/10 points Previous Answers SerPSE10 22.3.OP.008.MI.

My Notes Ask Your Teacher

Three charged particles are located at the corners of an equilateral triangle as shown in the figure below (let q = 3.40 μC, and L = 0.390 m). Calculate the total electric force on the 7.00-μC charge.

magnitude 1.545 ✓ N

direction 352 ✓ ° (counterclockwise from the $+x$ axis)



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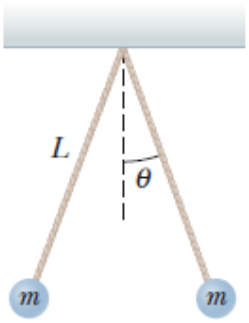
3. 10/10 points Previous Answers SerPSE10 22.3.OP.009.

My Notes Ask Your Teacher

(a) A physics lab instructor is working on a new demonstration. She attaches two identical conducting globes with mass m = 0.190 g to strings of length L as shown in the figure.



Both globes have the same charge of 8.00 nC, and are in static equilibrium when θ = 4.70°. What is L (in m)? Assume the strings are massless.

0.374 ✓ m

(b) **What If?** The charge on both globes is increased until each string makes an angle of θ = 9.40° with the vertical. If both globes have the same electric charge, what is the charge (in nC) on each globe in this case?

23 ✓ nC

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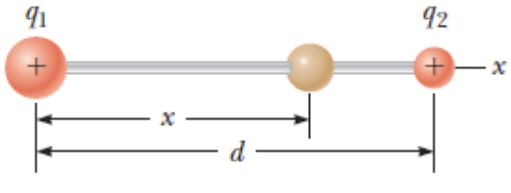
4. 10/10 points Previous Answers SerPSE10 22.3.P.007. My Notes Ask Your Teacher

Two small beads having positive charges $q_1 = 13q$ and $q_2 = q$ are fixed at the opposite ends of a horizontal insulating rod of length $d = 1.50$ m. The bead with charge q_1 is at the origin. As shown in the figure below, a third small, charged bead is free to slide on the rod.



(a) At what position x is the third bead in equilibrium?

$x =$ 1.17 ✓ m

(b) Can the equilibrium be stable?

- (•) Yes, if the third bead has a positive charge. ✓
- ( ) Yes, if the third bead has a negative charge.
- ( ) No

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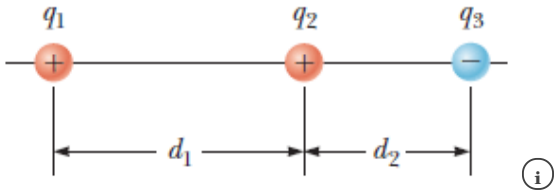
5. 10/10 points Previous Answers SerPSE10 22.3.P.010. My Notes Ask Your Teacher

Three point charges lie along a straight line as shown in the figure below, where q_1 = 5.58 µC, q_2 = 1.53 µC, and q_3 = -2.16 µC. The separation distances are d_1 = 3.00 cm and d_2 = 2.00 cm. Calculate the magnitude and direction of the net electric force on each of the charges.



(a) q_1

magnitude 41.98 ✓ N

direction to the left ✓

(b) q_2

magnitude 159.73 ✓ N

direction to the right ✓

(c) q_3

magnitude 117.75 ✓ N

direction to the left ✓

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6. 10/10 points Previous Answers SerPSE10 22.3.P.012. My Notes Ask Your Teacher

Particle A of charge 2.70×10^{-4} C is at the origin, particle B of charge -6.36×10^{-4} C is at (4.00 m, 0), and particle C of charge 1.07×10^{-4} C is at (0, 3.00 m). We wish to find the net electric force on C.

(a) What is the *x* component of the electric force exerted by A on C?
0 ✓ N

(b) What is the *y* component of the force exerted by A on C?
28.89 ✓ N

(c) Find the magnitude of the force exerted by B on C.
24.5 ✓ N

(d) Calculate the *x* component of the force exerted by B on C.
19.6 ✓ N

(e) Calculate the *y* component of the force exerted by B on C.
-14.7 ✓ N

(f) Sum the two *x* components from parts (a) and (d) to obtain the resultant *x* component of the electric force acting on C.
19.6 ✓ N

(g) Similarly, find the *y* component of the resultant force vector acting on C.
14.19 ✓ N

(h) Find the magnitude and direction of the resultant electric force acting on C.
magnitude 24.2 ✓ N
direction 35.9 ✓ ° counterclockwise from the +*x*-axis

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7. 10/10 points Previous Answers SerPSE10 22.4.OP.011.

My Notes Ask Your Teacher

Consider an electric field perpendicular to a table top. When a small charged sphere of mass 4.12 g and charge −18.1 μC is carefully placed in the field, the sphere is in static equilibrium. What are the magnitude and direction of the electric field? (Give the magnitude in N/C.)

magnitude 2230.72 ✓ N/C

direction downward ✓

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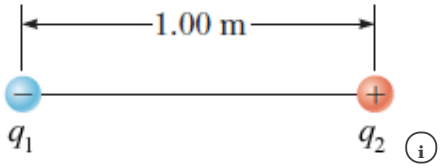
8. 10/10 points Previous Answers SerPSE10 22.4.OP.015.MI.

My Notes Ask Your Teacher

In the figure below, determine the point (other than infinity) at which the electric field is zero. (Let q_1 = -1.60 μC and q_2 = 7.00 μC.)

0.916 ✓ m to the left of q_1 ✓



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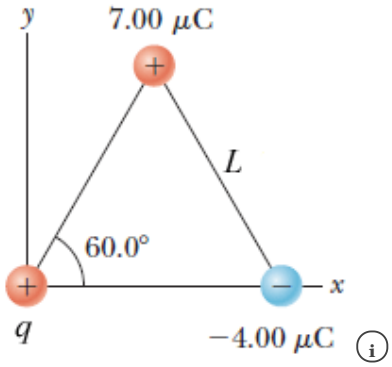
9. 10/10 points Previous Answers SerPSE10 22.4.OP.016.

My Notes Ask Your Teacher

Three charged particles are at the corners of an equilateral triangle as shown in the figure below. (Let q = 2.00 μC, and L = 0.600 m.)



(a) Calculate the electric field at the position of charge q due to the 7.00-μC and −4.00-μC charges.

12.5 ✓ kN/C **î** + -151.554 ✓ kN/C **ĵ**

(b) Use your answer to part (a) to determine the force on charge q.

25 ✓ mN **î** + -303.1 ✓ mN **ĵ**

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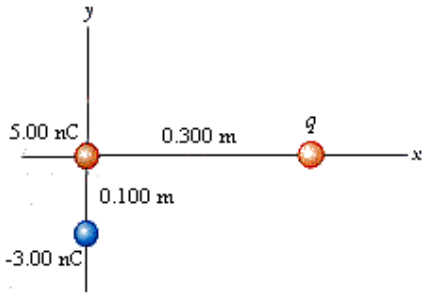
10. 10/10 points Previous Answers SerPSE10 22.4.P.021.

My Notes Ask Your Teacher

Three point charges are arranged as shown in the figure below.



(a) Find the vector electric field that the q = 2.50 nC and -3.00 nC charges together create at the origin.

-250 ✓ N/C **î** + -2700 ✓ N/C **ĵ**

(b) Find the vector force on the 5.00 nC charge.

-1.25 ✓ μN **î** + -13.5 ✓ μN **ĵ**

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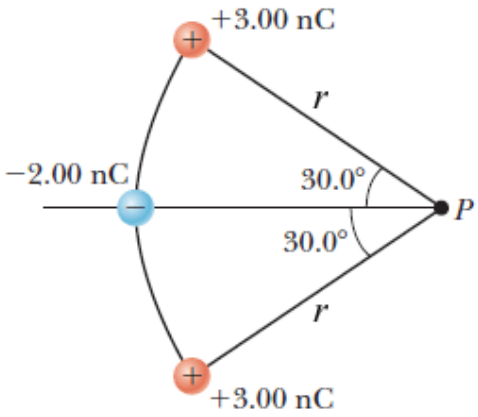
11. 10/10 points Previous Answers SerPSE10 22.4.P.019.

My Notes Ask Your Teacher

Three point charges are located on a circular arc as shown in the figure below. (Take r = 3.80 cm. Let to the right be the $+x$ direction and up along the screen be the $+y$ direction.)



(a) What is the total electric field at P, the center of the arc?

$\vec{\mathbf{E}}$ = 19900 ✓ $\hat{\mathbf{i}}$ N/C + 0 ✓ $\hat{\mathbf{j}}$ N/C

(b) Find the electric force that would be exerted on a -5.38–nC point charge placed at P.

$\vec{\mathbf{F}}$ = -0.000107 ✓ $\hat{\mathbf{i}}$ N + 0 ✓ $\hat{\mathbf{j}}$ N

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