CENGAGE | WEBASSIGN

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(sign out)

Chapter 23 HW (Homework)

INSTRUCTOR
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Current Score

QUESTION	1	2	3	4	5	6	7	8	9	
POINTS	0.83/0.83	0.63/0.83	0.83/0.83	0.83/0.83	0.83/0.83	0.83/0.83	0.83/0.83	0.83/0.83	0.83/0.83	0.8

TOTAL SCORE

9.8/10	98.0%

Due Date Past Due

SAT, SEP 19, 2020
11:59 PM GMT+4

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.

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. **[0.83/0.83 Points]** DETAILS | PREVIOUS ANSWERS **SERPSE10 23.1.OP.001.**

MY NOTES | ASK YOUR TEACHER | PRACTICE ANOTHER

A rod 10.0 cm long is uniformly charged and has a total charge of -23.0 μC. Determine the magnitude and direction of the electric field along the axis of the rod at a point 34.0 cm from its center.

magnitude 1.828e+06 ✓ N/C

direction toward the rod ✓

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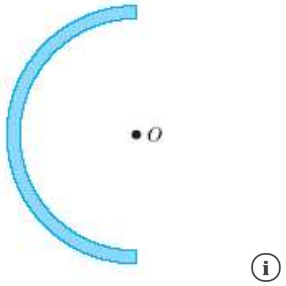
2. [0.63/0.83 Points] DETAILS PREVIOUS ANSWERS SERPSE10 23.1.OP.003.MI.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

A uniformly charged insulating rod of length 10.0 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.

4.2e7 ✓ 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?

5.4e7 ✗ 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

✓

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3. [0.83/0.83 Points] DETAILS PREVIOUS ANSWERS SERPSE10 23.1.P.003.MI.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

A uniformly charged ring of radius 10.0 cm has a total charge of 93.0 μC. Find the electric field on the axis of the ring at the following distances from the center of the ring. (Choose the x-axis to point along the axis of the ring.)

(a) 1.00 cm
8.24 ✓ î MN/C

(b) 5.00 cm
29.9 ✓ î MN/C

(c) 30.0 cm
7.93 ✓ î MN/C

(d) 100 cm
0.823 ✓ î MN/C

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4. [0.83/0.83 Points] DETAILS PREVIOUS ANSWERS SERPSE10 23.2.OP.006.MI.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

A 41.0-cm-diameter circular loop is rotated in a uniform electric field until the position of maximum electric flux is found. The flux in this position is measured to be 5.62×10^5 N · m^2/C. What is the magnitude of the electric field?
4.257 ✓ MN/C

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5. [0.83/0.83 Points] DETAILS PREVIOUS ANSWERS SERPSE10 23.2.OP.008.MI.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

An electric field of magnitude 4.50 kN/C is applied along the x axis. Calculate the electric flux through a rectangular plane 0.350 m wide and 0.700 m long if the following conditions are true.

(a) The plane is parallel to the yz plane.

1.10e3 ✓ $N \cdot m^2/C$

(b) The plane is parallel to the xy plane.

0 ✓ $N \cdot m^2/C$

(c) The plane contains the y axis, and its normal makes an angle of 39.4° with the x axis.

0.85e3 ✓ $N \cdot m^2/C$

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6. [0.83/0.83 Points] DETAILS PREVIOUS ANSWERS SERPSE10 23.2.P.011.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

A flat surface of area 3.10 m^2 is rotated in a uniform electric field of magnitude $E = 7.10 \times 10^5$ N/C.

(a) Determine the electric flux through this area when the electric field is perpendicular to the surface.

2.2e6 ✓ $N \cdot m^2/C$

(b) Determine the electric flux through this area when the electric field is parallel to the surface.

0 ✓ $N \cdot m^2/C$

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7. [0.83/0.83 Points] DETAILS PREVIOUS ANSWERS SERPSE10 23.3.OP.009.MI.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

The following charges are located inside a submarine: 4.50 μC, −9.00 μC, 27.0 μC, and −77 μC.

(a) Calculate the net electric flux through the hull of the submarine.

-6.16e6 ✓ $N \cdot m^2/C$

(b) Is the number of electric field lines leaving the submarine greater than, equal to, or less than the number entering it?

- ○ greater than
- ○ equal to
- ◉ less than ✓

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8. [0.83/0.83 Points] DETAILS PREVIOUS ANSWERS SERPSE10 23.3.OP.010.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

The electric field everywhere on the surface of a thin, spherical shell of radius 0.730 m is of magnitude 904 N/C and points radially toward the center of the sphere.

(a) What is the net charge within the sphere's surface?

-53.4 ✓ nC

(b) What is the distribution of the charge inside the spherical shell?

- ○ The negative charge has an asymmetric charge distribution.
- ○ The positive charge has an asymmetric charge distribution.
- ◉ The negative charge has a spherically symmetric charge distribution. ✓
- ○ The positive charge has a spherically symmetric charge distribution.

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9. [0.83/0.83 Points] DETAILS PREVIOUS ANSWERS SERPSE10 23.4.P.027.MI.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

A large, flat, horizontal sheet of charge has a charge per unit area of 9.90 μC/m^2. Find the electric field just above the middle of the sheet.

magnitude 559 ✓ kN/C

direction upward ✓

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10. [0.83/0.83 Points] DETAILS PREVIOUS ANSWERS SERPSE10 23.4.P.029.MI.

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

A uniformly charged, straight filament 3.80 m in length has a total positive charge of 2.00 μC. An uncharged cardboard cylinder 4.80 cm in length and 10.0 cm in radius surrounds the filament at its center, with the filament as the axis of the cylinder.

(a) Using reasonable approximations, find the electric field at the surface of the cylinder.

magnitude 94.65 ✓ kN/C

direction radially outward ✓

(b) Using reasonable approximations, find the total electric flux through the cylinder.

2854.6 ✓ N · m^2/C

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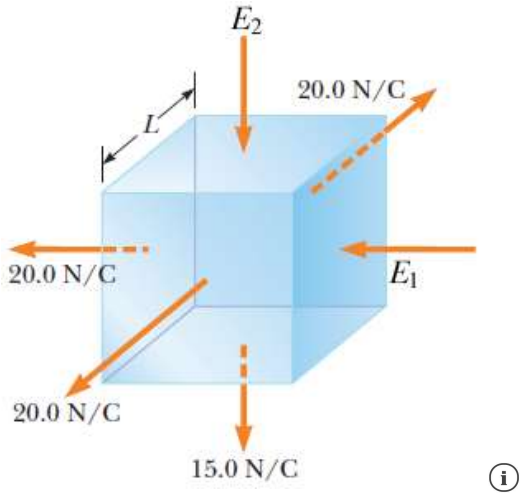
11. **[0.83/0.83 Points]** DETAILS PREVIOUS ANSWERS **SERPSE10 23.4.P.032.**

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

Assume the magnitude of the electric field on each face of the cube of edge L = 1.04 m in the figure below is uniform and the directions of the fields on each face are as indicated. (Take E_1 = 31.8 N/C and E_2 = 25.5 N/C.)



(a) Find the net electric flux through the cube.

19 ✓ N · m^2/C

(b) Find the net charge inside the cube.

1.68e-10 ✓ C

(c) Could the net charge be a single point charge?

- Yes
- (●) No ✓

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12. **[0.87/0.87 Points]** DETAILS PREVIOUS ANSWERS **SERPSE10 23.XP.007.**

MY NOTES ASK YOUR TEACHER PRACTICE ANOTHER

An insulating sphere is 8.00 cm in diameter and carries a 6.90 μC charge uniformly distributed throughout its interior volume. Calculate the charge enclosed by a concentric spherical surface with the following radius.

(a) r = 2.00 cm

862.5 ✓ nC

(b) r = 5.00 cm

6.9 ✓ μC

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