*assignment 2*

sb-prob2406a.problem

   *Due date: Fri Jan 23 11:59:59 pm 2026 (EST)*

1.          A     uniform     electric     field     27.2$i$     +
43.1$j$     N/C     intersects     a     surface     of     area
0.82m$^2$.*Whatisthefluxthroughthisareaifthesurfaceliesintheyz-plane*?

[                    ]

**You are correct.** Your receipt no. is 163-3147 What is the
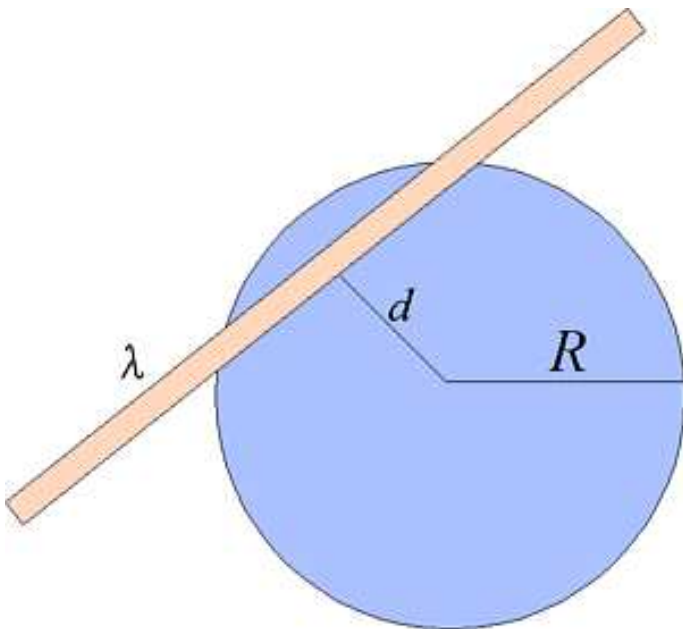flux through this area if the surface lies in the xz-plane?

[                    ]

**You are correct.** Your receipt no. is 163-1145 What is the
flux through this area if the surface lies in the xy-plane?

[                    ]

**You are correct.** Your receipt no. is 163-7304

sb-prob2418.problem

2. An infinitely long line charge having a uniform charge per
unit length $\lambda$=1.07E-6C/m lies a distance d=0.291m from
point O, as shown. Determine the total electric flux through
the surface of a sphere of radius R=0.558m centred at O
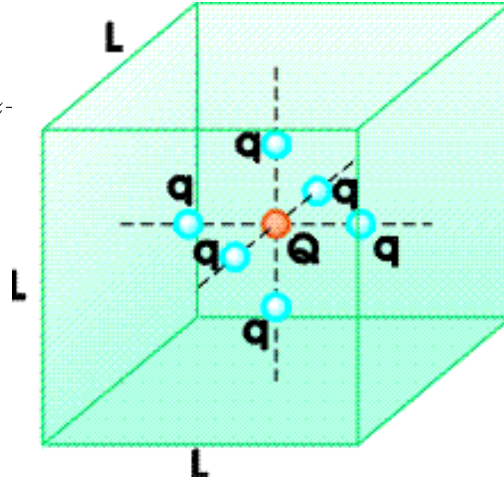resulting from this line charge.

[                    ]

**You   are   correct.**      Your   receipt   no.      is   163-9538



sb-prob2419.problem

3. A point charge $Q = 4.98$uC is located at the center of
a cube of side $L = 0.181$m. In addition, six other identical
point charges having $q = $ -1.52uC are positioned symmetri-
cally around $Q$, as shown in the figure below. Determine the
electric flux through one face of the cube.

[                    ]

**You   are   correct.**      Your   receipt   no.      is   163-4273



sb-prob2427a.problem

4. A solid sphere of radius 42.8cm has a total positive charge
of 23.6uC uniformly distributed throughout its volume. Cal-
culate the magnitude of the electric field 0cm from the center
of the sphere.

[                    ]

**You are correct.** Your receipt no. is 163-3505 Calculate
the magnitude of the electric field 8.70cm from the center of
the sphere.

[                    ]

**You are correct.** Your receipt no. is 163-148 Calculate the
magnitude of the electric field 42.8cm from the center of the
sphere.

[                    ]

**You are correct.** Your receipt no. is 163-3790 Calculate
the magnitude of the electric field 51.0cm from the center of
the sphere.

[                    ]

**You are correct.** Your receipt no. is 163-6786

sb-prob2434a.problem

5. An insulating sphere is 7.53cm in diameter and carries
a 5.57uC charge uniformly distributed throughout its inte-
rior volume. Calculate the charge enclosed by a concentric
spherical surface with radius $r = 1.77$cm.

[                    ]

**You are correct.** Your receipt no. is 163-8079 Calculate the
charge enclosed by a concentric spherical surface with radius
$r = 5.71$cm.

[                    ]

**You are correct.** Your receipt no. is 163-5906

sb-prob2449a.problem

6. A solid conducting sphere of radius 2.03cm has a charge
7.68uC. A conducting spherical shell of inner radius 3.98cm
and outer radius 5.13cm is concentric with the solid sphere
and has a charge -4.38uC. Calculate the electric field at $r =$
1.42cm from the center of this charge configuration.

**You are correct.** Your receipt no. is 163-2057 Calculate the electric field at $r = 2.50$cm from the center of this charge configuration.
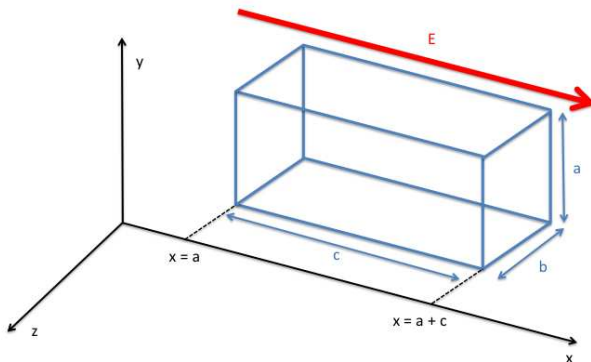
**You are correct.** Your receipt no. is 163-3814 Calculate the electric field at $r = 4.34$cm from the center of this charge configuration.

**You are correct.** Your receipt no. is 163-5519 Calculate the electric field at $r = 6.73$cm from the center of this charge configuration.

**You are correct.** Your receipt no. is 163-3633

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sb-prob2462a.problem
7. A closed surface with dimensions $a = b = 0.430$m and $c = 0.580$m is located as shown in the figure below. The electric field throughout the region is nonuniform and given by $\mathbf{E} = (3.12 + 1.84x^2)\mathbf{i}$N/C, where $x$ is in meters.



Calculate the net electric flux leaving the closed surface.

**You are correct.** Your receipt no. is 163-5631 What net charge is enclosed by the surface?

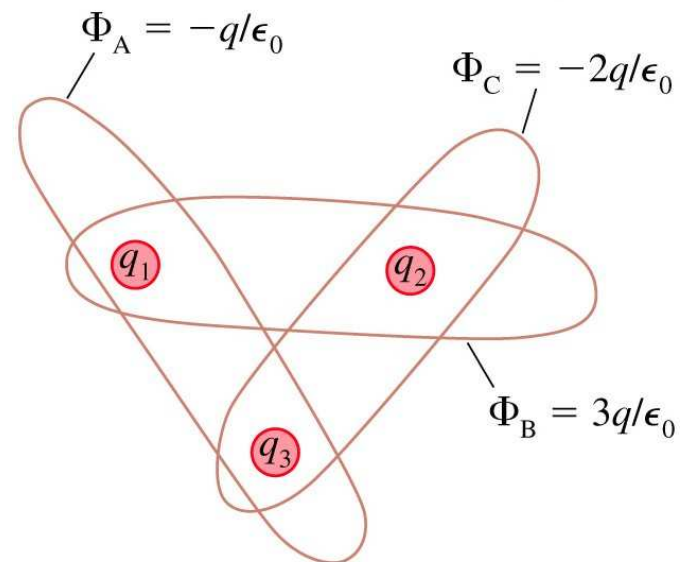**You are correct.** Your receipt no. is 163-3823

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sb-prob2428a.problem
8. A cylindrical shell of radius 6.11E-2m and length 2.51m has its charge uniformly distributed on its curved surface. The magnitude of the electric field at a point 0.161m radially outward from its axis (measured from the midpoint of the shell) is 3.89E+4N/C. Use approximate relations to find the net charge on the shell.

**You are correct.** Your receipt no. is 163-8670 Find the electric field at a point 0.04cm from the axis, measured radially outward from the midpoint of the shell.

**You are correct.** Your receipt no. is 163-4055

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kn-prob2730a.problem
9. The figure below shows three Gaussian surfaces and the electric flux through each. If q = 43.50nC.



What is the charge of $q_1$?

**You are correct.** Your receipt no. is 163-4413 What is the charge of $q_2$?

**You are correct.** Your receipt no. is 163-8288 What is the charge of $q_3$?

**You are correct.** Your receipt no. is 163-3026
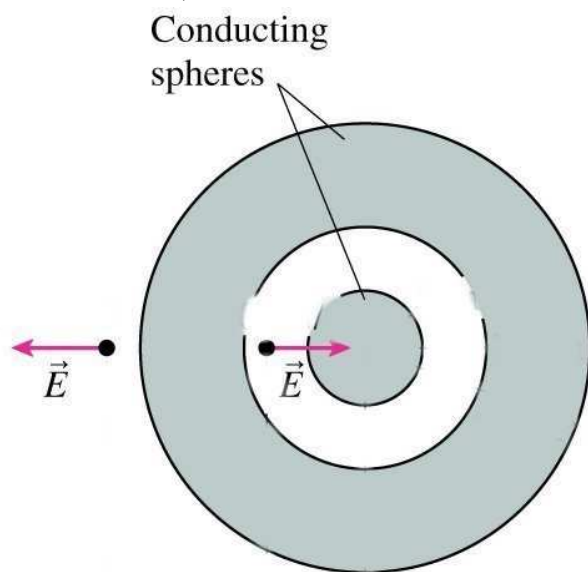
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kn-prob2734a.problem
10. A thin, horizontal square copper plate has a length of 14.79cm and is charged with $4.00 \times 10^8$ electrons. If the electrons are uniformly distributed on the surface, calculate the value of the electric field (with the upward direction positive) 3.44mm above the centre of the top surface of the plate.

**You are correct.** Your receipt no. is 163-769 What is the strength of the electric field at the plate's centre of mass?

**You are correct.** Your receipt no. is 163-8195

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kn-prob2739a.problem

11. The figure below shows a solid metal sphere at the centre of a hollow metal sphere. The radius of the solid metal sphere is 4.97cm, the inner radius of the hollow sphere is 9.1cm, and the outer radius of the hollow sphere is 14.0cm. The electric field (shown on the diagram) inside the hollow sphere, at a distance of 7.91cm from the centre of the solid metal sphere, has a magnitude of 14310N/C. The strength of the electric field at a point 37.7cm from the centre of the solid metal sphere is also 14310N/C.



Conducting spheres

$\vec{E}$          $\vec{E}$

What is the total charge on the exterior of the inner sphere?

**You are correct.** Your receipt no. is 163-4667 What is the total charge on the inside surface of the hollow sphere?

**You are correct.** Your receipt no. is 163-7131 What is the total charge on the exterior surface of the hollow sphere?

**You are correct.** Your receipt no. is 163-8682