Worksheet: Electric Fields of Point Charges

Q1: A charged object produces an electric field strength of magnitude 1.05×10^{-8} N/C at a distance of 2.6 m from its center. Find the charge of the object. Use 8.988×10^{-9} N$\cdot$m^2/C^2 for the value of Coulomb's constant. Answer to two significant figures.

A 5.8 C

B 0.33 C

C 3.0 C

D 7.9 C

E 0.13 C

Q2: An object with a charge of 1.5 C is at a point in anelectric field where the field strength is 12 N/C. What is the magnitude of the force on theobject?

A 5.3 N

B 27 N

C 96 N

D 8.0 N

E 18 N

Q3: An object has a charge of 335 mC. At a point near the object, the strength of the electric field from the object has a magnitude of 5.65×10^{-7} N/C. Find the distance from the object to the point. Use 8.988×10^{-9} $\mathrm{N \cdot m^2/C^2}$ for the value of Coulomb's constant. Answer to two significant figures.

A 0.073 m

B 2.3 m

C 4.6 m

D 5.3 m

E 0.0053 m

Q4: An object with a charge of 0.25 C is at a point in anelectric field where the force exerted on it by the field is 16 N. What is themagnitude of the field strength at the point occupied by the object?

A 260 N/C

B 16 N/C

C 4.0 N/C

D 64 N/C

E 120 N/C

Q5: A charged object is at a point in an electric field wherethe force exerted on it by the field is 0.015 N and the field strength at thatpoint is 2.5 N/C in the same direction as the force on the object. What is thecharge of the object?

A 0.000090 C

B 170 C

C 0.0060 C

D 417 C

E 0.0024 C

Q6: An object has a charge of 125 mC. Find the electric field strength 36 cm from the object. Use 8.988×10^{-9} N·m^2/C^2 for the value of Coulomb's constant. Answer to two significant figures.

A 8.7×10^{-10} N/C

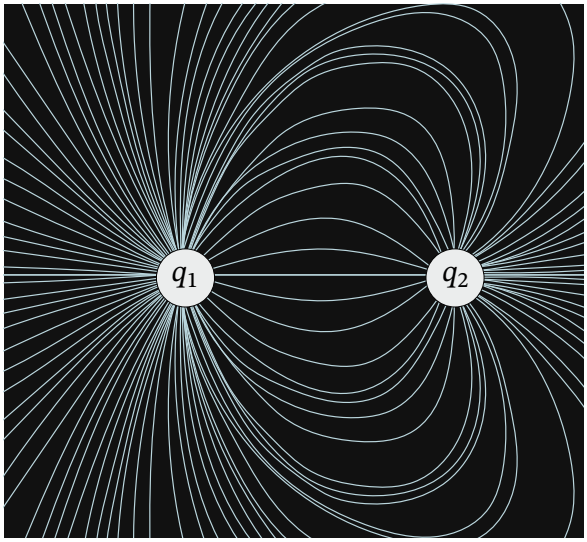
B 3.1×10^{-9} N/C

C 3.2×10^{-10} N/C

D 8.7×10^{-9} N/C

E 2.5×10^{-9} N/C

Q7: An object with a charge of q_1 is located near an object with a charge of q_2, as shown in the diagram. Which of the following sets of values of q_1 and $q_2$are consistent with the field lines of the electric field that the objects produce?



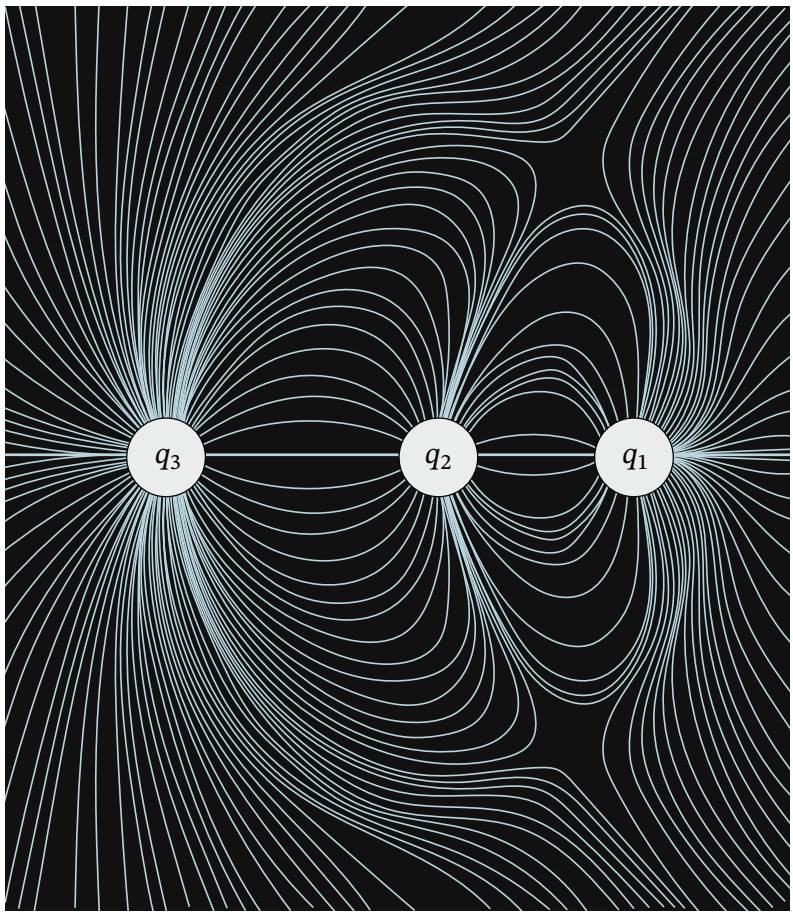
A $q_1 = 1\ \text{C}, q_2 = -2\ \text{C}$

B $q_1 = -2\ \text{C}, q_2 = 1\ \text{C}$

C $q_1 = -1\ \text{C}, q_2 = 1\ \text{C}$

D $q_1 = 2\ \text{C}, q_2 = 1\ \text{C}$

Q8: An object with a charge of q_1 is located near to two other objects with charges of q_2 and q_3, as shown in thediagram. Which of the following sets of rankings of the magnitudes of q_1, q_2, and q_3 are consistent with the field lines of the electric field that the objects produce?



A $q_1 > q_2 > q_3$

B $q_1 < q_2 < q_3$

C $q_1 < q_2$ and $q_2 = q_3$

D $q_1 = q_2$ and $q_2 < q_3$