Name: _____ Date: _____ Period: _____

Worksheet 17D- Electric Field

* USE seperate Page
* Show all work
* Circle your answer

Sample Problem

A typical thundercloud has an electric field of about 3.0 _105 N/C. If the electric field is directed toward the ground. What is the electric force on an 18 nC charge in this field?

SOLUTION

Given: $E = 3.0 \times 10^5$ N/C $q = 18$ nC $= 1.8 \times 10^{-8}$ C

Unknown: $F_{electric} = ?$

Choose the equation(s) or situation: Use the definition of electric field and rearrange it to solve for

$F_{electric}$.

$E = F_{electric}/q$

$F_{electric} = Eq = (3.0 \times 10^5 \text{ N/C})(1.8 \times 10^{-8} \text{ C})$

$F_{electric} = 5.4 \times 10^{-3}$N, directed toward the ground

ADDITIONAL PRACTICE

1. An electric field of 9.0 N/C is directed along the positive *x*-axis. What is the electric force on a –6.0 C charge in this field?

2. An electric field of 1500 N/C is directed along the positive *y*-axis. What is the electric force on a 5.0 nC charge in this field?

3. Millikan's experiment measures the charge of an electron by suspending charged oil droplets in an electric field. If an oil droplet with a mass of 3.35×10^{-15} kg has the same charge as an electron. What electric force is required to balance the weight of the oil droplet?

4. An electric field of 1663 N/C is directed along the positive *x*-axis. If the electric force on a charge is 8.42×10^{-9} N, what is the charge?

5. An electric field of 4.0×10^3 N/C is directed downward. If the electric force on a charge is 6.43×10^{-9} N, what is the charge?