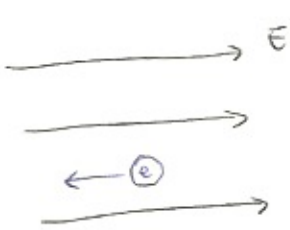
Physics: Electric Fields & Electric Potential

Electric Field: Measuring the Electric Field Using a Test Charge

Example 1:
An electric field of 2.0×10^4 N/C is directed along the positive x-axis.
What is the magnitude and direction of the electric force on an electron placed in the field?



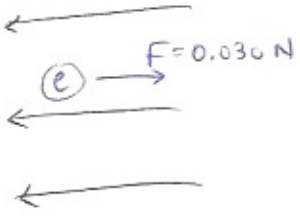
$E = \frac{F}{|q|}$

$F = E \cdot |q|$

$F = (2.0 \times 10^4) \cdot |-1.60 \times 10^{-19}|$

$F = 3.2 \times 10^{-15}$ N
negative x-direction
against the field

Example 2:
A negative charge of -1.5×10^{-7} C experiences a force of 0.030 N to the right in an electric field. What is the magnitude and direction of the electric field?



Field must be going to the left.
Negative charges always move against the field.

$E = \frac{F}{|q|}$

$E = \frac{0.030}{|-1.5 \times 10^{-7}|}$

$E = 2.0 \times 10^5$ N/C
to the left
negative x-direction