Solving Difficult Electric Field Problems
Lesson Notes

Focus Question:

How can the electric field equation be combined with vector physics and algebra to conduct a force analysis of an electrostatic phenomenon?

Electric Field Strength

The equation for electric field strength (**E**) is written as follows:

$$E = k \cdot \frac{Q_{Source}}{d^2} \qquad k = 9.0 \times 10^9 \text{ N} \cdot \text{m}^2/\text{C}^2$$

This video steps through the solution to four complex problems. Here are the four problems.

Problem 1

Two charges - A and B C - lie along the cm-axis at the positions as shown. Their charge values and type are listed. Determine the net electric field at the midpoint (40-cm mark).
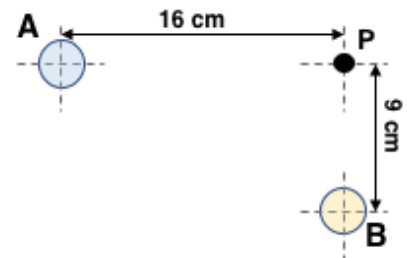

$Q_A = +5.4 \ \mu C$

$Q_B = -3.6 \ \mu C$

Problem 2

Two charges - A and B - are arranged as shown. Their charge values and type are listed. Determine the net electric field at point P.
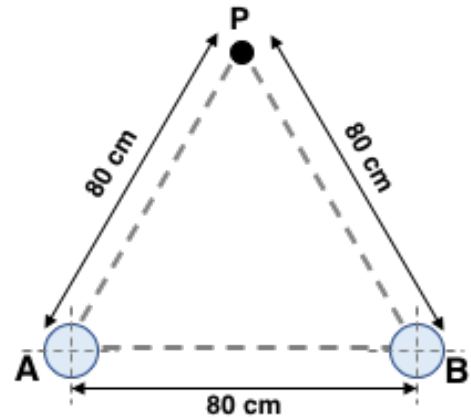

$Q_A = +5.4 \ \mu C$

$Q_B = -3.6 \ \mu C$

Problem 3

Two identical charges - A and B - lie at the lower corners of an equilateral triangle that measures 80 cm along each edge. The charge values are +2.8 µC. Determine the net electric field at the third corner of the triangle.

P

80 cm

80 cm

A

B

80 cm

Problem 4

Charge A (+3.8 µC) and Charge B (-5.2 µC) lie 100-cm apart along the axis as shown. Where along the axis is the net electric field 0 N/C?

A

B

0 cm

100 cm

Q_A = +3.8 µC

Q_B = -5.2 µC