

QUESTION

The force between a 30- μC charge and a -90 μC charge is 6.8 N. How far apart are they?

Question 20 4 pts

The force between a 30- μC charge and a -90- μC charge is 6.8 N. How far apart are they?

☐ 2.3 m

☐ 3.7 m

☐ 4.2 m

☐ 1.9 m

Answer

$$r = 1.9 \text{ m}$$

Explanation

Given

$$F = 6.8 \text{ N}$$

$$Q_1 = 30\mu\text{C}$$

$$Q_2 = 90\mu\text{C}$$

$$F = kQ_1Q_2/r^2 ;$$

$$k = 8.99 \times 10^9 \text{ N m}^2/\text{C}^2$$

Required;

$$r = ?$$

Solution:

$$F = kQ_1Q_2/r^2$$

$$6.8 = 8.99 \times 10^9 (30 \times 10^{-6})(90 \times 10^{-6}) / r^2$$

$$r^2 = 24.273 / 6.8$$

$$= 3.57$$

$$r = \sqrt{3.57}$$

$$r = 1.9 \text{ m}$$