

**Answer on Question #50848-Physics-Electromagnetism**

Let the charges  $Q$  and  $-Q$  be placed alternatively along the  $x$ -axis at positions  $x = 1$  m,  $x = 3$  m,  $x = 6$  m and  $x = 9$  m. What is the electric field at  $x = 0$  due to these charges?

**Solution**

According to the principle of superposition the electric field at  $x = 0$  due to these charges is

$$E = k \sum \frac{q_i}{r^2} = k \left( \frac{Q}{(1-0)^2} - \frac{Q}{(3-0)^2} + \frac{Q}{(6-0)^2} - \frac{Q}{(9-0)^2} \right) = kQ \left( 1 - \frac{1}{9} + \frac{1}{36} - \frac{1}{81} \right) = \frac{293}{324} kQ.$$

The electric field at  $x = 0$  has directed negatively.