

5. The electric field is defined as the electric force divided by the magnitude of the test charge, so if we multiply both sides of the equation by the magnitude of the test charge we can determine the force.

$$E = F / q$$

$$E q = F$$

$$F = (30 \text{ N / C}) (4.0 \text{ C})$$

$$F = 120 \text{ N}$$

The electric field is directed downward, and the direction of the electric field vector tells us the direction in which a positive charge would move, so the force is also directed downward. If the charge had a negative sign it would experience a force in the upward direction in this same electric field.