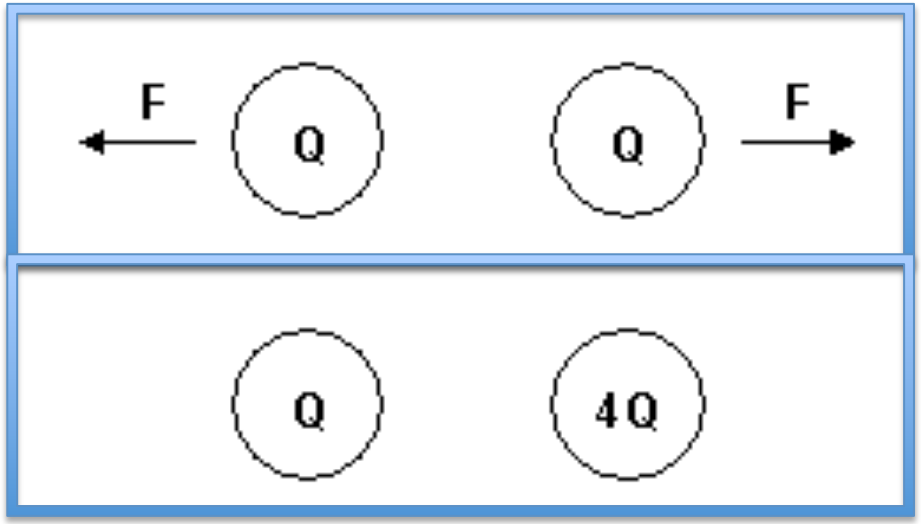
Three identical charges are lined up in a row. If we compare the electric force charge q_1 exerts on charge q_3 ($F_{1\rightarrow 3}$) to the force q_2 exerts on charge q_3 ($F_{2\rightarrow 3}$)

1. $F_{1\rightarrow 3}$ is twice as big as $F_{2\rightarrow 3}$.
2. $F_{1\rightarrow 3}$ is half as big as $F_{2\rightarrow 3}$.
3. $F_{1\rightarrow 3}$ is more than twice as big as $F_{2\rightarrow 3}$.
4. $F_{1\rightarrow 3}$ is less than half as big as $F_{2\rightarrow 3}$.
5. $F_{1\rightarrow 3}$ doesn't affect q_3 at all since q_2 is in the way.

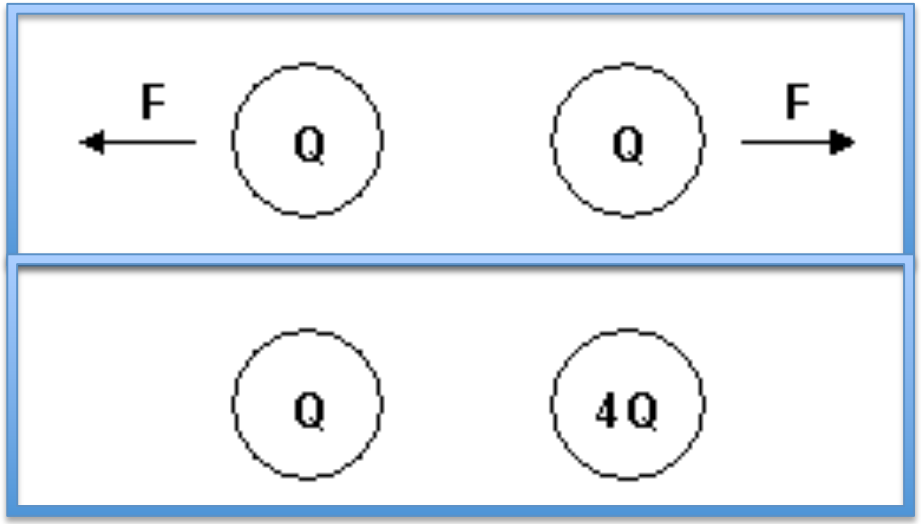
Two small objects each with a net charge of +Q exert a force of magnitude F on each other (top figure). We replace one of the objects with another whose net charge is +4Q (bottom figure). The original magnitude of the force on the +Q charge was F; what is the magnitude of the force on the +Q now?

1. 16F
2. 4F
3. F
4. F/4
5. Something else.



In the original state we assumed Q was positive. If the symbol Q were taken to have a negative value, how would the forces change compared to the original state?

1. Would stay the same
2. Both would reverse
3. Only the left force would reverse
4. Only the right force would reverse
5. Something else

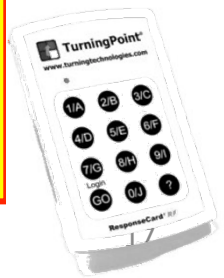


Reading question

Are electric fields and gravitational fields the same regarding the acceleration that results from them? For example, in free fall all objects accelerate toward the center of Earth with the same magnitude regardless of mass. In an electric field, do source charges accelerate toward test charges with the same magnitude regardless of charge?

What do you think?

A. Yes
B. No



The electric field at a particular point in space

1. Depends only on the magnitude of the test charge used to measure it.
2. Depends only on the sign of the test charge used to measure it.
3. Depends on both the sign and magnitude of the test charge used to measure it.
4. Does not depend on the test charge used to measure it.
5. None of the above.

A test charge, q, is a distance d from a charge Q as shown. It feels an electric field, E_0. If q were replaced by a charge $-3q$, the electric field on it would

1. Change to $-3E_0$
2. Change to $-E_0/3$
3. Not change
4. Change to $3E_0$
5. Change to $E_0/3$
6. Something else