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Coulomb's law

Link to the [Coulomb's law simulation](#)

Play with the simulation for a couple of minutes, to explore what you can do with it.

1. Coulomb's law can be used to find, for instance, the magnitude of the force that one charged object exerts on another charged object. If the two objects have charges of q and Q , and they are separated by a distance r , the magnitude of the force that each feels because of the other is $|kqQ|$ divided by ...

[] r [] r^2 [] r^3

The force is attractive if the charges are of opposite sign, and repulsive if the charges have the same sign. The value of k rounds off to $9.0 \times 10^9 \text{ N m}^2 / \text{C}^2$.

2. What is the magnitude of the force each object feels if the distance between them is 1.0 m?

_____ N

3. If you double the distance between the charges, the force decreases by a factor of ____

Note that you can't use the simulation to answer questions 4 and 5 - you will have to calculate those answers yourself. Try to find the answers just by determining by what factor the force will change when you plug in the new distance, starting from some value that you know.

4. What is the magnitude of the force each object feels if the distance between them is 0.5 m?

_____ N

5. What is the magnitude of the force each object feels if the distance between them is 16.0 m?

_____ N

6. If each object has the same magnitude charge, what is the magnitude of that charge?

_____ C

7. If, instead, one object has a charge of magnitude 2×10^{-4} C, what is the magnitude of the other charge?

_____ C

This worksheet was created by Andrew Duffy of Boston University on Dec. 27, 2022.