

CLASS EXERCISE #4 - 16 June 2005

Here are some statements about the electric force. Determine if each is true or false. If false, explain why, by giving a counterexample or correcting the statement.

(1) The electric force between two electric charges is always an attractive force.

False. Sometimes it is a repulsive force, as is the case when both electric charges have the same sign (both positive or both negative).

(2) The electric force is inversely proportional to the square of the distance between two charged particles.

True.

(3) Two objects cannot have both an attractive gravitational force and an attractive electrical force between them.

False. If both objects have mass, and one has a positive electric charge and the other a negative electric charge, they will have both an attractive gravitational force and an attractive electrical force between them.

(4) The electric force between two electrons separated by a distance d has the same magnitude as that between two protons separated by the same distance d .

True.