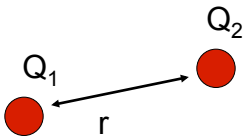
Coulomb's Law:

$$F = k\frac{Q_1 Q_2}{r^2}$$

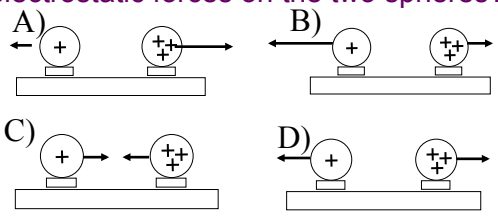


k =9.0 x 10^9 [Nm^2/C^2]

2

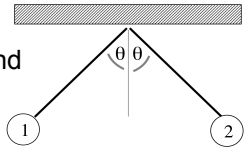
2 uniformly charged spheres are attached to frictionless pucks on an air hockey table (so both are free to move).
The charge on sphere #2 is three times larger than that on #1...

Which force diagram correctly shows the relative magnitudes and directions of the electrostatic forces on the two spheres?



E) None of these can be correct

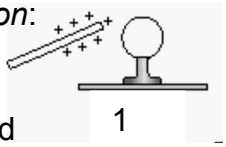
Two equal mass pith balls are charged, and hang on strings as shown:



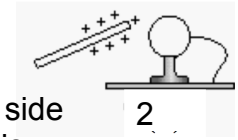
What can we conclude about the *magnitudes* of charges Q1 and Q2?

A: Both are equal (Q1=Q2)
B: Not enough information to decide

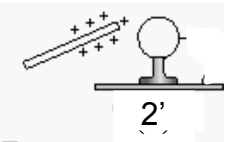
Charging by induction:



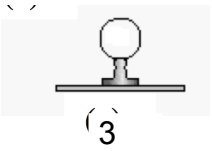
(1) A positively charged rod is placed *near* a conducting object attached to an insulating glass pedestal (but *not* touching.)



(2) The opposite side of the conductor is grounded for a short time interval.

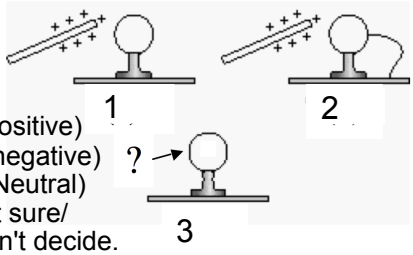


2’: Then the ground wire is removed…



3) and finally the rod is removed…

What is the charge remaining on the conductor, in the end?



A: **+** (positive)
B: **-** (negative)
C: 0 (Neutral)
D: Not sure/ can't decide.

SI Unit of Charge:
The Coulomb [C]

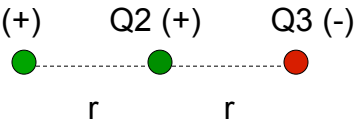
Charge of one proton:

$q_{proton} = +1.6 \times 10^{-19}$ [C] = **e**

Charge of one electron:

$q_{electron} = -1.6 \times 10^{-19}$ [C] = - **e**

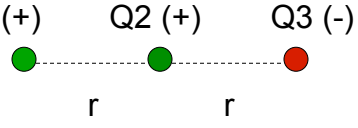
3 charges, Q1, Q2, and Q3 are in a line as shown



The signs are shown, but you do NOT know their magnitudes.
The net force on **Q2** is to the

A: Right B: Left
C: Don't know/ not enough information.

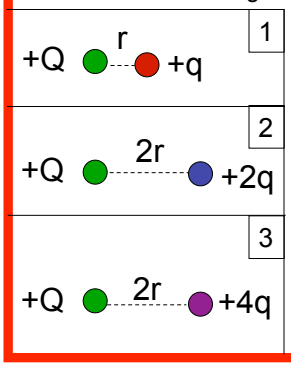
3 charges, Q1, Q2, and Q3 are in a line as shown



The signs are shown, but you do NOT know their magnitudes.
The net force on **Q1** is to the

A: Right B: Left
C: Don't know/ not enough information.

Consider the following situations, labeled 1, 2 & 3



Which charge (+Q) feels the largest force?

A) +q (situation 1)
B) +2q (sit. 2)
C) +4q (sit. 3)
D) two of them tie for largest force.
E) other/not sure

The smallest force?

Two protons are near each other. Each feels an electrostatic repulsion of magnitude F_{elec} and a gravitational attraction of magnitude F_{grav}, due to the other proton.

As the charges are moved apart, the ratio $\frac{F_{elec}}{F_{grav}}$ …

A) Increases
B) Decreases
C) Remains constant