Two charged spheres are held a distance, r, apart. One sphere has a charge of +4µC, and the other sphere has a charge of +8µC. Compare the force of the +4µC sphere on the +8µC sphere with the force of the +8µC sphere on the +4µC sphere.

Coulomb's law states that the force F on a charge, q_1 at position r_1, experiencing an electric field due to the presence of another charge, q_2 at position r_2 in vacuum is:

$$\vec{F} = \frac{q_1 q_2}{4\pi\varepsilon_0} \frac{\widehat{\overrightarrow{r_{12}}}}{\overrightarrow{r_{12}}^2}$$

where $\overrightarrow{r_{12}} = \overrightarrow{r_1} - \overrightarrow{r_2}$ and ε_0 is the electric constant. This is simply the scalar definition of Coulomb's law with the direction given by the unit vector, $\widehat{\overrightarrow{r_{12}}}$, parallel with the line from charge q_2 to charge q_1.

The Coulomb's law equation provides an accurate description of the force between two objects whenever the objects act as point charges. A charged conducting sphere interacts with other charged objects as though all of its charge were located at its center. While the charge is uniformly spread across the surface of the sphere, the center of charge can be considered to be the center of the sphere. The sphere acts as a point charge with its excess charge located at its center.

Magnitude of force in our case:

$$F = \frac{8\mu\mathrm{C} * 4\mu\mathrm{C}}{4\pi\varepsilon_0 r^2}$$

Therefore, the forces are force pairs of each other so they will always be equal in magnotude and opposite in direction.

Answer: equal in magnitude and opposite in direction.