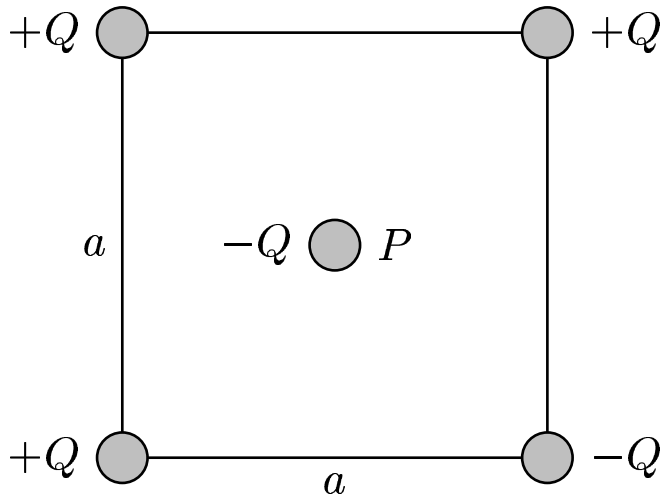


Four point charges are located a distance a apart at the corners of a square.

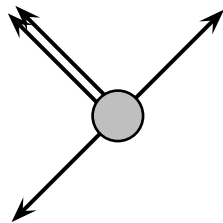


Determine the magnitude of the electric force on a negative charge $-Q$ located at the center of the square.

- A) $\|\vec{F}\| = 4 \frac{Q^2}{a^2}$. C) $\|\vec{F}\| = \sqrt{2} \frac{Q^2}{a^2}$.
- B) $\|\vec{F}\| = 2 \frac{Q^2}{a^2}$. D) $\|\vec{F}\| = \frac{Q^2}{a^2}$.

Coulomb's law is $\vec{F}_{AB} = k \frac{Q_A Q_B}{r^2} \hat{r}_{AB}$, which tells us that unlike charges attract and like charges repel.

$$\|\vec{F}\| = 2 \frac{Q^2}{\left(\frac{a}{\sqrt{2}}\right)^2} = 4 \frac{Q^2}{a^2}.$$



Answer **A**.