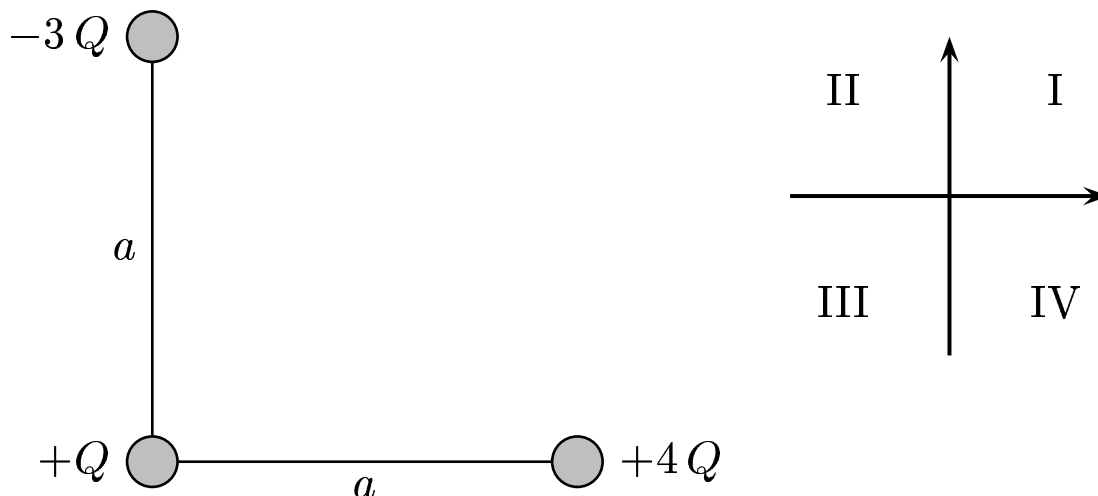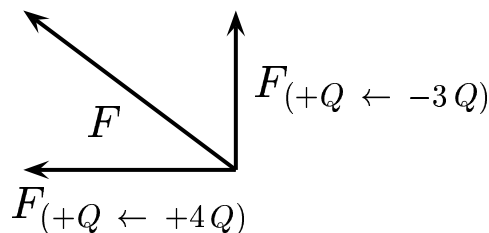Q is at the origin, $+4Q$ is on the positive x-axis a distance a from the origin, and $-3Q$ is on the positive y-axis a distance a from the origin.

Determine the magnitude of the electric force on the charge $+Q$ at the bottom left-hand corner (at the origin).

A) $\|\vec{F}\| = 3\dfrac{Q^2}{r^2}$.

B) $\|\vec{F}\| = 4\dfrac{Q^2}{r^2}$.

C) $\|\vec{F}\| = 5\dfrac{Q^2}{r^2}$.

D) $\|\vec{F}\| = \sqrt{5}\dfrac{Q^2}{r^2}$.

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

$$\|\vec{F}\| = \sqrt{4^2 + 3^2}\,\frac{Q^2}{a^2} = 5\,\frac{Q^2}{r^2}.$$

Answer **C**.