Five identical point charges, each having charge Q, are equally spaced on a semicircle of radius, a, as shown below. Find the net force on a charge, q, located equidistant from the five other charges. Be sure to simplify your answer and somehow specify the direction of the net force.

\[ F_x = F \sin \theta - F \sin \theta = 0 \]

\[ F_y = F + F \cos \theta + F \cos \theta \]
\[ = F \left( 1 + 2 \cos \theta \right) \]
\[ = \frac{kQq}{r^2} \left( 1 + 2 \sqrt{2} \right) \]
\[ = \frac{kQq}{r^2} \left( 1 + \sqrt{2} \right) = \frac{kQq}{r^2} (2.414) \]

Extra Credit: (must get both) Who caught and who threw the immaculate reception? (1 point)