

Question 16067

a) The charge at point A creates field at B, with electric field strength $|\vec{E}_1| = \frac{kq}{AB^2}$, where

$q = 4 \cdot 10^{-7} \text{ C}$. Similarly, the charge at point C, created field at B with field strength

$|\vec{E}_2| = \frac{kq}{BC^2}$. As $AB \perp BC$, and the fields are pointed along these lines to B, the resultant field

is $E = \sqrt{E_1^2 + E_2^2} = kq \sqrt{\frac{1}{AB^4} + \frac{1}{BC^4}} \approx 1,15 \cdot 10^6 \text{ N C}^{-1}$.

b) The force exerted on the charge at B is:

$$F = E q = 1,15 \cdot 10^6 \text{ N C}^{-1} \cdot 4 \cdot 10^{-7} \text{ C} = 0,46 \text{ N}.$$