

64. (a) At $x = 0.040$ m, the net field has a rightward ($+x$) contribution (computed using Eq. 24-13) from the charge lying between $x = -0.050$ m and $x = 0.040$ m, and a leftward ($-x$) contribution (again computed using Eq. 24-13) from the charge in the region from $x = 0.040$ m to $x = 0.050$ m. Thus, since $\sigma = q/A = \rho V/A = \rho \Delta x$ in this situation, we have

$$\left| \vec{E} \right| = \frac{\rho(0.090 \text{ m})}{2\epsilon_0} - \frac{\rho(0.010 \text{ m})}{2\epsilon_0} = 5.4 \text{ N/C} .$$

- (b) In this case, the field contributions from all layers of charge point rightward, and we obtain

$$\left| \vec{E} \right| = \frac{\rho(0.100 \text{ m})}{2\epsilon_0} = 6.8 \text{ N/C} .$$