

30. Let \hat{i} be a unit vector pointing to the left. We use Eq. 24-13.

- (a) To the left of the plates: $\vec{E} = (\sigma/2\varepsilon_0)\hat{i}$ (from the right plate) + $(-\sigma/2\varepsilon_0)\hat{i}$ (from the left one) = 0.
- (b) To the right of the plates: $\vec{E} = (\sigma/2\varepsilon_0)(-\hat{i})$ (from the right plate) + $(-\sigma/2\varepsilon_0)(-\hat{i})$ (from the left one) = 0.
- (c) Between the plates:

$$\begin{aligned}\vec{E} &= \left(\frac{\sigma}{2\varepsilon_0}\right)\hat{i} + \left(\frac{-\sigma}{2\varepsilon_0}\right)(-\hat{i}) = \left(\frac{\sigma}{\varepsilon_0}\right)\hat{i} \\ &= \left(\frac{7.0 \times 10^{-22} \text{ C/m}^2}{8.85 \times 10^{-12} \frac{\text{N}\cdot\text{m}^2}{\text{C}^2}}\right)\hat{i} = (7.9 \times 10^{-11} \text{ N/C}) \hat{i} .\end{aligned}$$