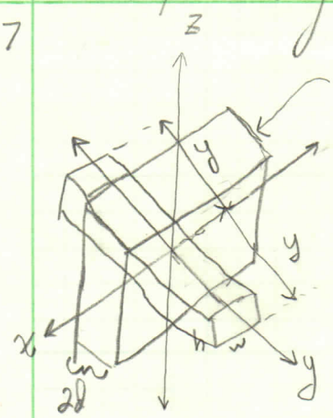
2.17



$$\oint_S \vec{E}\cdot d\vec{A} = \frac{Q_{enc}}{\varepsilon_0}\,; \quad Q_{enc} = 2hw\,d\rho$$

for $0 \le y \le d$

$$Q_{enc} = 2hwy$$

$$\oint_S \vec{E}\cdot d\vec{A} = |\vec{E}_1| \oint_S dA = |\vec{E}_1|\,2hw = \frac{2hwy\rho}{\varepsilon_0}$$

$$\Rightarrow \vec{E}_1 = \frac{\rho}{\varepsilon_0} y\,\hat{y}$$

for $y \ge d$

$$Q_{enc} = 2hwd$$

$$\Rightarrow |\vec{E}_2|\,2hw = \frac{2hwd\rho}{\varepsilon_0} \Rightarrow \vec{E}_2 = \frac{d\rho}{\varepsilon_0}\,\hat{y}$$