

VERSTÄOC

Solutions:

a)  $|z| > d$

$$\vec{D} = \vec{E} = \vec{P} = 0$$

$0 < z < d$

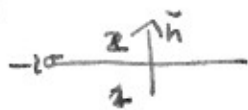
$$\vec{D} = -\sigma \vec{e}_z ; \quad \vec{E} = -\frac{\sigma}{\epsilon} \vec{e}_z ; \quad \vec{P} = -\frac{\epsilon - \epsilon_0}{\epsilon} \sigma \vec{e}_z$$

$-d < z < 0$

$$\vec{D} = \sigma \vec{e}_z ; \quad \vec{E} = \frac{\sigma}{\epsilon} \vec{e}_z ; \quad \vec{P} = \frac{\epsilon - \epsilon_0}{\epsilon} \sigma \vec{e}_z$$

b)  $\phi(d) - \phi(0) = \frac{\sigma}{\epsilon} d$

c)



$$D_{n2} = -\sigma ; \quad D_{n1} = \sigma$$

$$D_{n2} - D_{n1} = -\sigma - \sigma = -2\sigma \quad \checkmark$$

d)  $\sigma' = \vec{P}(d) \cdot \vec{n}$  with  $\vec{n} = \vec{e}_z \Rightarrow \sigma' = -\frac{\epsilon - \epsilon_0}{\epsilon} \sigma$