a) $E_z(x, z=0^-, t) = E_z^{(incident)} + E_z^{(reflected)} \Rightarrow$

$$E_z(x, z=0^-, t) = (r_p - 1) E_p \sin\theta \exp\{ik_0(\sin\theta\, x - ct)\}; \qquad k_0 = \omega/c \quad \checkmark$$

($r_p - 1$: reflected; E_p: incident; $\sin\theta\, x$: σ_x)

b) $D_\perp(x, z=0, t) = \epsilon_0 E_z(x, z=0^-, t) = \epsilon_0 \epsilon(\omega) E_z(x, z=0^+, t) \Rightarrow$

$$E_z(x, z=0^+, t) = \frac{r_p - 1}{\epsilon(\omega)} E_p \sin\theta \exp\{ik_0(\sin\theta\, x - ct)\} \quad \checkmark$$

c) $\vec{\nabla}\cdot\vec{E} = \rho/\epsilon_0 \Rightarrow E_z(x, z=0^+, t) - E_z(x, z=0^-, t) = \frac{1}{\epsilon_0}\sigma_s(x, z=0, t) \Rightarrow$

$$\sigma_s(x, z=0, t) = \epsilon_0\left[\frac{1}{\epsilon(\omega)} - 1\right](r_p - 1) E_p \sin\theta \exp\{ik_0(\sin\theta\, x - ct)\} \quad \checkmark$$