

3.14

$$V(x, y) = \frac{4V_0}{\pi} \sum_{n \in 2N-1} \frac{1}{n} e^{-n\pi x/a} \sin(n\pi y/a)$$

$$\sigma = \epsilon_0 \frac{\partial V}{\partial n} \Rightarrow \frac{\sigma}{\epsilon_0} = \vec{\nabla} V \cdot \hat{n}$$

here, $\hat{n} = \hat{x}$ so

$$\frac{\sigma}{\epsilon_0} = \frac{\partial V}{\partial x}$$

$$\frac{\partial V}{\partial x} = -\frac{4V_0}{a} \sum_{n \in 2N-1} e^{-n\pi x/a} \sin\left(\frac{n\pi y}{a}\right)$$

for $x=0$

$$\sigma = -\frac{4V_0 \epsilon_0}{a} \sum_{n \in 2N-1} \sin\left(\frac{n\pi y}{a}\right)$$