

$$\begin{aligned}
 (5) \quad E &= \frac{q}{A \cdot \epsilon_0} = \frac{1.0 \times 10^{-6} \text{ C}}{2.0 \text{ m}^2 \times (8.85 \times 10^{-12} \text{ C}^2/\text{N} \cdot \text{m}^2)} \\
 &= \boxed{5.6 \times 10^4 \text{ N/C}}
 \end{aligned}$$

$$\begin{aligned}
 (6) \quad E &= 2\pi k \sigma \left(1 - \frac{x}{(x^2 + R^2)^{1/2}} \right) \\
 \sigma &= \frac{3 \times 10^{-6}}{\pi \times 0.3 \times 0.3} = 1.06 \times 10^{-5}
 \end{aligned}$$

$$\begin{aligned}
 E_x &= 2\pi k \sigma \left[1 - \left(\frac{x}{\sqrt{x^2 + R^2}} \right) \right] \\
 &= 2\pi (9 \times 10^9 \text{ N} \cdot \text{m}^2/\text{C}^2) (1.06 \times 10^{-5}) \left[1 - \frac{0.15}{\sqrt{(0.15)^2 + (0.3)^2}} \right] \\
 &= 331349 = \boxed{3.31 \times 10^5 \text{ N/C}}
 \end{aligned}$$