

## Engineering 5812 Assignment 2 Answers

1. 2.62 mC
2. 0.173 C
3.  $\pi\rho_{S_0} [1 - e^{-a}(1 + a)]$
4.  $-202.2(\hat{x} + \hat{y}) \mu\text{C}$
5.  $-63.13 \mu\text{C}$
6.  $-1.6\hat{x} - 0.66\hat{y} \text{ MV/m}$
7.  $\hat{\rho} \frac{\rho\ell}{2\pi\epsilon_0\rho} \frac{L/2}{\sqrt{\rho^2 + (L/2)^2}}$
8.  $\frac{5\hat{x}}{2\pi\epsilon_0} \left[ \frac{2a}{a^2 + b^2} - \frac{1}{a} \right] \text{ nV/m}$
9. Answer on assignment.
10. Answer on assignment.
11. (a)  $x = 0.5 + \frac{1}{2} \ln \left[ \frac{\cos(2y)}{\cos(\pi/5)} \right]$ ; (b)  $\hat{E}_P = \sin(0.2\pi)\hat{x} - \cos(0.2\pi)\hat{y}$