

Homework 8
EE 381 Electric & Magnetic Fields (Fall 2024)
Tuesday, October 22, 2024

- 1) A rectangular plate, described by $-1.2 \leq x \leq 1.2$ m, $-1 \leq y \leq 1$ m, & $z = 2$ m in free space, supports a surface charge density $-240 x^2 \mu\text{C}/\text{m}^2$. Find the total charge on the plate. Also, find the electric field and flux density vectors at $z = -10$ m.
- 2) 4.2
- 3) 4.6
- 4) 4.17
- 5) 4.23 Also, find the volume charge density.
- 6) A hemisphere located at $r = 0.5$ m and $\pi/2 < \theta < \pi$ in free space has a uniform surface charge density of $12 \mu\text{C}/\text{m}^2$. Find the electric field and electric flux density vectors at the origin. If a $-8 \mu\text{C}$ point charge is placed at the origin, what force does it experience?
- 7) 4.29
- 8) 4.33 For part b), also determine \mathbf{D} at $r = 2$ m.

Due Monday, October 28, 2024