PSET 9 - DUE APRIL 21

1. 11.9:8 (4 points)

2. 11.15:2 (4 points)

3. 11.15:6 (4 points)

4. 11.15:13 (4 points)

5. 11.18:10 (6 points)

6. Let R, S be bounded subsets of the plane with corresponding density functions f_R, f_S respectively. Let $T = R \cup S$ and define f_T to be the appropriate density function on each component of T. Let $m(R), m(S)$ denote the respective masses of R, S. Prove

$$(\overline{x}_T, \overline{y}_T) = \frac{(\overline{x}_R m(R) + \overline{x}_S m(S), \overline{y}_R m(R) + \overline{y}_S m(S))}{m(R) + m(S)}.$$

Here $\overline{x}_U$ denotes the center of mass of the region U. (8 points)

18.024 Multivariable Calculus with Theory
Spring 2011