MA114 Summer 2018
Worksheet 21 – Centers of Mass – 7/19/18

1. Find the center of mass for the system of particles of masses $4, 2, 5$, and 1 located at the coordinates $(1, 2), (3, 2), (2, 1)$, and $(4, 0)$.

2. Point masses of equal size are placed at the vertices of the triangle with coordinates $(3, 0), (b, 0)$, and $(0, 6)$, where $b > 3$. Find the center of mass.

3. Find the centroid of the region under the graph of $y = 1 - x^2$ for $0 \leq x \leq 1$.

4. Find the centroid of the region under the graph of $f(x) = \sqrt{x}$ for $1 \leq x \leq 4$.

5. Find the centroid of the region between $f(x) = x - 1$ and $g(x) = 2 - x$ for $1 \leq x \leq 2$.

6. Bonus Fun Problem: Find the mass of a square plate with vertices at $(0, 0), (3, 0), (0, 3)$, and $(3, 3)$ with changing density function $\rho(x) = x + 5$ for $0 \leq x \leq 3$.