Math 2415
Homework on 16.4

1. Use Green's Theorem to evaluate $\int_C y^3 \, dx - x^3 \, dy$ where C is the circle $x^2 + y^2 = 9$ oriented clockwise.

2. Evaluate the line integral by two methods: (a) directly and (b) using Green's Theorem: $\int_C -y\mathbf{i} + x\mathbf{j}$ where C is the circle $x^2 + y^2 = R^2$ traversed counterclockwise.

3. Use Green's Theorem to calculate $\int_C \mathbf{F} \cdot d\mathbf{r}$, where

   (a) $\mathbf{F}(x, y) = (x - y)\mathbf{i} + (y - x)\mathbf{j}$ and C is the boundary of the square $[0, 1] \times [0, 1]$ traversed clockwise.

4. Find the area of the region between the graphs $y = x^2$ and $y = x^3$.