HW 11 (to be tested on June 10)

1. Prove that the double integral of a step function is independent of the partition chosen. Moreover, prove additivity, linearity, and comparsion for the double integral of step functions.

2. Prove Green's theorem for Type-III domains.

3. Calculate the following

   (a) $\int\int_{[0,t]\times[1,t]} y^{-3}e^{tx/y}dxdy$

   (b) The volume of a right-circular cone using triple integration.

   (c) $\int_C(y^2dx+xdy)$ along a square (in the clockwise direction) with vertices $(0,0),(2,0),(2,2),(0,2$

   (d) $\int\int_S(x-y)^2\sin^2(x+y)dxdy$ over a parallelogram S with vertices $(\pi,0),(2\pi,\pi),(\pi,2\pi),(0,\pi)$.