

## homework 5

1. Let  $D$  be the triangular region drawn below.

- a) Let  $\rho_0(x, y) = 1$ . Compute the center of mass of  $D$  and draw it in the diagram.
- b) Let  $\rho_1(x, y) = x$ . Compute the center of mass of  $D$  and draw it in the diagram.
- c) Let  $\rho_2(x, y) = x^2$ . Compute the center of mass of  $D$  and draw it in the diagram.
- d) If you took  $\rho(x, y) = x^n$  with higher and higher powers of  $x$  how would the center of mass move?

2. Use polar coordinates to find the integral of the function  $f(x, y) = xy$  over the region  $D = \{(x, y) | 4 \leq x^2 + y^2 \leq 9, x \leq 0, y \geq 0\}$