

Show all your work to receive full credit.

1. Show  $\int_D \int 2x - y \, dA = \frac{2}{3} - \frac{\sqrt{2}}{2}$  where  $D$  is the region in the first quadrant enclosed by the circle  $x^2 + y^2 = 1$  and the lines  $y = x$  and  $x = 0$ .

2. Evaluate  $\int_{-2}^2 \int_0^{\sqrt{4-x^2}} \cos(x^2 + y^2) \, dy \, dx$  by first converting the double integral to polar coordinates.