Math 13 Worksheet #4: Applications of double integration

(1) Find the mass and center of mass of the lamina that occupies the region D and has the density function $\rho(x, y) = kx$, where D is bounded by $y = x^2$ and $y = x + 2$.

(2) A lamina occupies the region inside the circle $x^2 + y^2 = 2y$ and outside the circle $x^2 + y^2 = 1$. Find the center of mass if the density is inversely proportional to its distance.