1. Let C be the closed curve given by the semicircle $x^2 + y^2 = 1$, $y \geq 0$ traced from $(1,0)$ to $(-1,0)$ together with the line segment from $(-1,0)$ to $(1,0)$. Let $\mathbf{F} = \langle x - y, x + y \rangle$. Find the work done by $\mathbf{F}$ in moving a particle along C.

2. Evaluate $\int_C (xy\,dx + x\,dy)$ where C is the part of the hyperbola $xy = 1$ traced from $(1,1)$ to $(2, \frac{1}{2})$.