3)

Given $R_\theta(f(x,y))(\rho) = \int \delta(\rho - x\cos\theta - y\sin\theta)\, f(x,y)\, dx\, dy$

Find Radon Tx of $f(x-x_0, y-y_0)$

$= \int \delta(\rho - x\cos\theta - y\sin\theta)\, f(x-x_0, y-y_0)\, dx\, dy$

$= \int \delta(\rho - x_0\cos\theta - y_0\sin\theta - u\cos\theta - v\sin\theta)\, f(u,v)\, du\, dv \qquad x = x_0 + u,\ y = y_0 + v$

$= R_\theta(f(x,y))(\rho - x_0\cos\theta - y_0\sin\theta)$