Exercise 2 solution: Let k be an integer and x a real number. $\pi R_\omega(x) = x + \omega + k \mod 1 = x + \omega \mod 1$. On the other hand, $r_\omega \pi(x) = (x \mod 1 + \omega) \mod 1 = x + \omega \mod 1$. Thus R_ω is a lift of r_ω.