MATH 416, HW 5

Let $\{h(k) : k = 0, \ldots, L\}$, $\{g(k) : k = 0, \ldots, L\}$ be a pair of Conjugate Quadrature Mirror Filters of finite length $L + 1 < \infty$. Let $c \in \mathbb{R}^d$ ($d > L$, d is even). Let $H(c)(n) = \sum_k h(k)c(k + 2n)$ and $G(c)(n) = \sum_k g(k)c(k + 2n)$. Thus, H and G can be identified with $(d/2) \times d$ matrices, as in class. Let A^* denote the adjoint to a matrix A.

1) Show that $HH^* = GG^* = Id$.

2) Show that $HG^* = GH^* = 0$.