

Homework #3

1. Papoulis & Pillai 9-18, 9-21, 9-27, 9-34, 9-35, 9-42, 9-48, 9-52
2. (*From ALG 7-26*) Let $Y(t)$ be the output of a linear system with impulse response $h(t)$ and input $X(t) + N(t)$. Let $Z(t) = X(t) - Y(t)$. (a) Find $S_Z(\omega)$. (b) Find $S_Z(\omega)$ if we are given that $X(t)$ and $N(t)$ are independent random processes.
3. (*From ALG 7-31*) Let $Y_n = (X_{n+1} + X_n + X_{n-1})/3$ be a “smoothed” version of X_n . Find $R_Y[k]$, $S_Y(\omega)$, and $E\{Y_n^2\}$.
4. Papoulis & Pillai 12-1, 12-3