Homework 5

1. In Haar wavelet, \( h(0) = \frac{1}{\sqrt{2}} = h(1) \), and \( h(n) = 0 \) for all \( n \neq 0, 1 \). Verify that

\[
|H(\gamma)|^2 + |H(\gamma + \frac{1}{2})|^2 = 2.
\]

2. Problem 4.5.2 (i), page 318.

3. Let \( \tilde{z}(n) = \bar{z}(-n) \). Show that \( \tilde{\tilde{z}}(\gamma) = \bar{z}(\gamma) \). Further, assume \( y(n) = (-1)^n z(n) \). Show that \( \tilde{y}(\gamma) = \tilde{z}(\gamma + \frac{1}{2}) \).

4. Problem 3.1.2, page 188

5. Problem 3.1.3, page 189