Math 227 Assignment 7 Supplement

Due Friday, March 29

1) (5 points, #9, Section 4.8) Let

$$x_k = 2^k, \quad w_k = 5^k \cos\left(\frac{k\pi}{2}\right), \quad z_k = 5^k \sin\left(\frac{k\pi}{2}\right).$$

a) Show that the signals (x_k), (w_k), and (z_k) satisfy the homogeneous linear difference equation

$$y_{k+3} - 2y_{k+2} + 25y_{k+1} - 50y_k = 0. \tag{1}$$

b) Do the signals from part a) form a basis for the space of signals satisfying equation (1)? Justify your assertion.