

Homework 5

Michael Brodskiy

Professor: I. Salama

October 18, 2024

1. (a) We may begin by rewriting S_2 as:

$$w[n] = y[n] - \frac{1}{2}y[n-1]$$

S_1 may be rewritten in a similar format to get:

$$x[n] = w[n] - \frac{1}{4}w[n-1]$$

Substituting the first equation into the second, we get:

$$x[n] = y[n] - \frac{1}{2}y[n-1] - \frac{1}{4}\left[y[n-1] - \frac{1}{2}y[n-2]\right]$$

This can be simplified to:

$$x[n] = y[n] - \frac{3}{4}y[n-1] + \frac{1}{8}y[n-2]$$

- (b)
(c)
2. (a)
(b)
(c)
3. (a)
(b)
4. (a)
(b)
5.

6.

7. (a)

(b)

(c)

(d)

8. (a)

(b)

(c)

(d)

(e)

(f)

9. (a)

(b)

(c)

(d)

(e)