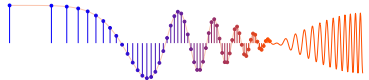
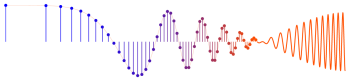


**EXERCISE 5.7:** Determine the difference equation for the block diagram of Fig. 5-14.

McClellan, Schafer and Yoder, *Signal Processing First,* ISBN 0-13-065562-7.
Prentice Hall, Upper Saddle River, NJ 07458. 

SOLUTION



The outputs of the UNIT-DELAYs are already labelled, so each output is multiplied by a constant and then added to form $y[n]$.

$$y[n] = -2x[n-3] + \Big(-x[n-2] + \big(2x[n-1] + (3x[n])\big)\Big)$$

$$= 3x[n] + 2x[n-1] - x[n-2] - 2x[n-3]$$

The filter coefficients are:

$$b_0 = 3, \quad b_1 = 2, \quad b_2 = -1, \quad \text{and} \quad b_3 = -2$$