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**EXERCISE 9.3:** Determine the impulse response  $h[n]$  of an FIR filter whose system function is

$$H(z) = 4(1 - e^{j\pi/2}z^{-1})(1 - e^{-j\pi/2}z^{-1})(1 + 0.8z^{-1})$$

Multiply the factors to get a polynomial and then determine the impulse response by “inverse  $z$ -transformation.”

*Note:* The terms with complex conjugate roots can be simplified as follows:

$$(1 - re^{j\theta}z^{-1})(1 - re^{-j\theta}z^{-1}) = 1 - 2r \cos(\theta)z^{-1} + r^2z^{-2}$$

