

信号处理原理 第 11 次作业

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$$\begin{aligned} X(z) &= \frac{2z^{-1} - z^{-2}}{1 - 1.6z^{-1} - 0.2z^{-2}} \\ &= \frac{2z^{-1} - z^{-2}}{(1 - 2z^{-1})(1 + 0.4z^{-1})} \\ &= A_0 + \frac{A_1}{1 - 2z^{-1}} + \frac{A_2}{1 + 0.4z^{-1}} \end{aligned}$$

$$\begin{aligned} A_0 &= X(0) = \frac{5}{4} \\ A_1 &= (1 - 2z^{-1})X(z)|_{z=2} = \frac{5}{8} \\ A_2 &= (1 + 0.4z^{-1})X(z)|_{z=-0.4} = -\frac{15}{8} \\ X(z) &= 1.25 + \frac{0.625}{1 - 2z^{-1}} - \frac{1.875}{1 + 0.4z^{-1}} \end{aligned}$$

$$\begin{aligned} |z| > 2, \quad x(n) &= 1.25\delta(n) + 0.625 \cdot 2^n \cdot u(n) - 1.875 \cdot (-0.4)^n \cdot u(n) \\ 0.4 < |z| < 2, \quad x(n) &= 1.25\delta(n) + 0.625 \cdot 2^n \cdot u(-n-1) + 1.875 \cdot (-0.4)^n \cdot u(n) \\ 0 < |z| < 0.4, \quad x(n) &= 1.25\delta(n) - 0.625 \cdot 2^n \cdot u(-n-1) + 1.875 \cdot (-0.4)^n \cdot u(-n-1) \end{aligned}$$