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Also accessible through http://www.github.com/soymarwin/ee274/EE274_ProgEx03

A. The Bilateral Z-Transform

$(a) \quad x(n) = (\frac{4}{3})^n u(1-n)$

$$x(n) = (\tfrac{4}{3})^n u(-n+1)$$

$$X(z) = \sum_{n=-\infty}^{\infty} x(n) z^{-n}$$

$$X(z) = \sum_{n=-\infty}^{\infty} (\tfrac{4}{3})^n u(-n+1) z^{-n}$$

$$Let\ k = -n+1\ and\ n = 1-k$$

$$X(z) = \sum_{n=-\infty}^{\infty} (\tfrac{4}{3})^{1-k} u(k) z^{k-1}$$

$$X(z) = \sum_{n=0}^{\infty} (\tfrac{4}{3}) \cdot (\tfrac{4}{3})^{-k} \cdot z^k \times z^{-1}$$

$$X(z) = (\tfrac{4z^{-1}}{3})\ \sum_{n=0}^{\infty} (\tfrac{3z}{4})^k$$

$$X(z) = \{^{(\frac{4z^{-1}}{3}) \cdot (\frac{1}{1-\frac{3z}{4}}),\ \frac{4}{3} > |z|}_{diverges,\ else}$$

$$or\ X(z) = \{^{\frac{4z^{-1}}{3-\frac{9z}{4}},\ \frac{4}{3} > |z|}_{diverges,\ else}$$

$$or\ X(z) = \{^{\frac{16z^{-1}}{12-9z},\ \frac{4}{3} > |z|}_{diverges,\ else}$$

$$or\ X(z) = \{^{\frac{16}{12z-9z^2},\ \frac{4}{3} > |z|}_{diverges,\ else}$$

$(b) \quad x(n) = 2^{-|n|} + (\frac{1}{3})^{|n|}$

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