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EE274_ProgEx03

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

A. The Bilateral Z-Transform

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

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

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

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

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

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

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

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

$X(z) = (\frac{4z^{-1}}{3}) \cdot (\frac{1}{1-\frac{3z}{4}}),\ 0\ <|\ z\ |<\ \frac{4}{3}$

$or\ X(z) = \frac{4z^{-1}}{3-\frac{9z}{4}},\ 0\ <|\ z\ |<\ \frac{4}{3}$

$or\ X(z) = \frac{16z^{-1}}{12-9z},\ 0\ <|\ z\ |<\ \frac{4}{3}$

$or\ X(z) = \frac{16}{12z-9z^2},\ 0\ <|\ z\ |<\ \frac{4}{3}$

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

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