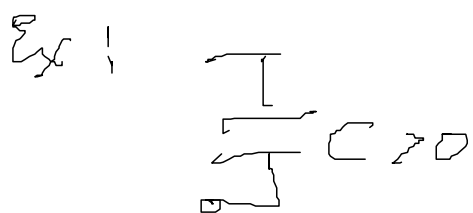


lossless: $\mathbf{1}_n - \int_{-j\omega}^+ S(j\omega) S(j\omega) = 0$

set $s = \omega/j$ get $\mathbf{1}_n = S^T[-s] S[s]$

$\Rightarrow S^{-1}[s] = S^T[-s]$



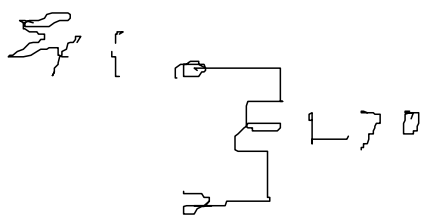
$S[s] = \frac{-Cs}{1 + Cs}$

$S[-s] = \frac{1 + Cs}{1 - Cs} = \frac{1}{S[s]}$

lossless: $Y^*(j\omega) + Y(j\omega) = 0_n$

$\Rightarrow Y^T[-s] + Y[s] = 0_n$

or $Y[s] = -Y^T[-s]$



$Y[s] = \frac{1}{Ls}$

$Y[-s] = \frac{1}{L[-s]} = -\frac{1}{Ls}$

or check

$Y[s] + Y[-s] = 0$

look at $\Re Y[s]$ in $\sigma > 0$

$2\Re Y = Y(\sigma + j\omega) + Y^*(\sigma + j\omega)$ in $\sigma > 0$