Notes in ECEN 5448

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Discrete Time Systems

largest pole inside unit circle, stable difference equation.
unit step function here is $1(k)$
look at the useful summations thing on web.
poles and zeros are the same as with the Laplace transform except z is the variable.

Z-transform properties, linearity.
convolution
time-shift
time invariance (shift the input, output will be shifted same amount), this doesn't really work well for sampled systems unless you shift by a multiple of the sample rate.
scaling property
Final-value theorem
methods of inverse transform.

$$F(z) = \frac{b_0 + b_1 z^{-1} + \cdots + b_m z^{-m}}{1 + a_1 z^{-1} + a_2 z^{-2} + \cdots + a_n z^{-n}}$$

can get to the form after this by multiplying by $\frac{z^n}{z^n}$.

$$= \frac{z^{n-m}(b_0 z^m + b_1 z^{m-1} + \cdots + b_m)}{z^n + a_1 z^{n-1} + a_2 z^{n-2} + \cdots + a_n}$$

then you can use partial fraction expansion to get it in a nice form.
inverse z transform integral exists.