Lecture 21 probably

Zeros – Values of ‘z’ that make the numerator equal to 0

Poles – Values of ‘z’ that make the denominator equal to 0

There are as many poles and zeros as the highest exponent of ‘z’ in the equation

- means there will be 3 zeros and 2 poles

For something to be a proper fraction, the highest upper exponent needs to be lower than the highest lower exponent.

- If the upper and lower exponents are equal, the multiplicand of the upper exponent needs to be lower than that of the lower exponent.

For improper fractions, you can long divide the top by the bottom in order to find out what the mixed fraction would look like.

After you have a proper fraction, you are able to do a partial fraction expansion of the denominator, then solve for each numerator.

You don’t even need to solve for the numerators yet! In this state, we can much easier perform an inverse z-transform on the equation, using the table of conversions.

to solve R1, exclude first partial in denominator, then plug in that partial’s pole for each value of z

rest of the Rs are the same, involving their respective partials in the denominator

to solve for a complex conjugate (two similar partials in the denominator), change the sign of the angle found for the first partial to get the value of the second one

- complex conjugate is if two partials are the same other than the sign of the complex number

A trick that sometimes works to avoid long division when ratio of polynomials is not proper before partial fraction expansion

- Works when numerator polynomial has at least one root at

- the shortcut is what we did in diff eq over summer (cover up algorithm)