# Topics



# Math review

## Partial fraction expansion (PFE)

Important for inverse Laplace and z-transforms. PFE allows you to split up a ratio of polynomials into a sum of fractions, with each denominator containing a single or repeated root.

Consider Nth and Mth-order polynomials

For , is a proper rational function. If you assume has no repeated roots, then the PFE of is

If you don’t assume no repeated roots, and each of roots has multiplicity such that , then

When (improper rational function), you need to use long division to reduce the numerator order to be less than the denominator order. You need to first put your ratio of polynomials in the form

Where is a proper rational function.