Partial Fraction

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2025/03/29

Consider this integral:

$$\int \frac{x+1}{x^2-5x+6}\mathrm{d}x$$

This integral looks scary, but notice that we can factor the denominator: $x^2-5x+6=(x-2)(x-3)$

Let's first take at look at fraction addition:

$$\frac{A}{B}+\frac{C}{D}=\frac{AD+BC}{BD}$$

Since the integrand is a fraction, and we successfully write the denominator as a product, we should be able to split the fraction into a sum of two fraction.

Assume we have split the fraction like this:

$$\frac{x+1}{(x-2)(x-3)}=\frac{A}{(x-2)}+\frac{B}{(x-3)}$$

Here and A and B are different