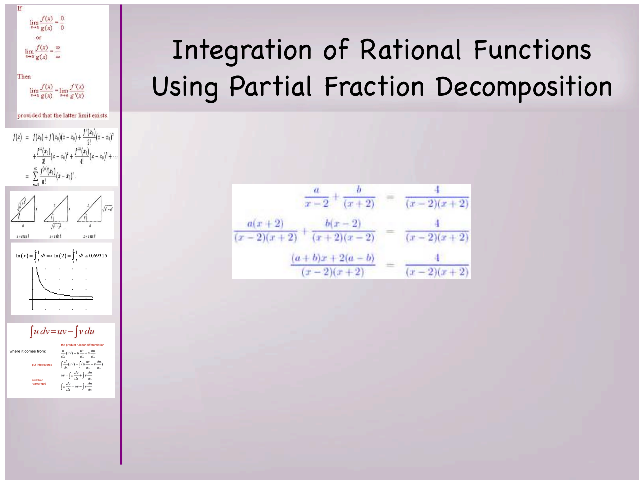

Partial Fraction Decomposition

A rational function is the quotient of two polynomials.

A proper rational function is the quotient of two polynomials where the numerator has a lower degree than the denominator.

Review of partial fraction decomposition (pfd)

EX 1 Rewrite this as a sum/difference of two fractions.

$$\frac{x-7}{x^2-x-12}$$

EX 2 $\int \frac{4x^2 - 6x + 2}{x^2(x-1)(x+3)}\,dx$

EX 3 $\int \frac{33x^2 - 7x + 70}{(3x-2)(x^2+4)}\,dx$

EX 4 $\int \frac{\cos x}{\sin^4 x - 16} dx$

EX 5 $\int \frac{x^6 - 7x^4 + 11x^3 - 13x^2 + x - 6}{x^3 - 2x^2} dx$