

**Math 1220 #12**  
**Integration of Rational Functions Using Partial**  
**Fraction Decomposition**

## 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**

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