Notes: Partial Fraction & Long Division (Rational Functions)   Additional Techniques of
                                                                        Integration Day 2

When integrating you always try and use s-substitution first. If that does not work then:

1. If degree of the numerator ≥ degree of denominator, then use long division to simplify the integrand. Then integrate.   (Marilyn or Dolly)

2. If the degree of the numerator < degree of denominator, then use partial fraction decomposition to simplify the integrand. Then integrate. (J-Lo)

Example One: $\int \frac{dx}{x^2-7x+10}$

Example Two: $\int \frac{x^2+2}{(x-1)(2x-8)(x+2)} dx$

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Example Three: $\int \frac{x^3+1}{x^2-4}dx$

Example Four: $\int \frac{3x-9}{(x-1)(x+2)^2}dx$

Lets Try More

1. $\int_0^3 \frac{5x^3-x}{x^2+1}$

2. $\int_2^3 \frac{dt}{t^2+3t-4}$

3. $\int \frac{u^4}{u^2+3} du$

4. $\int \frac{3x-4}{x^2-5x-6} dx$