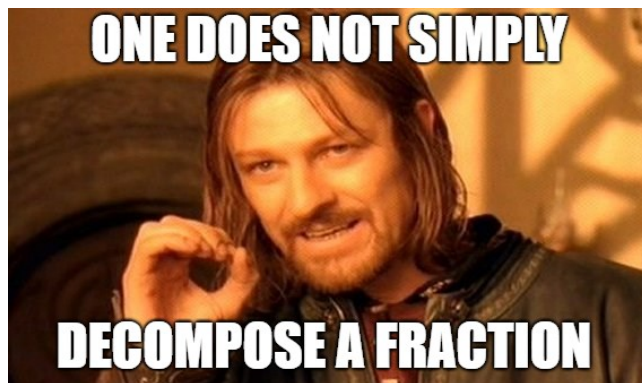


Calculus
Lesson 8.5: Using Partial Fraction
Decomposition to Integrate
Mrs. Snow, Instructor



In this lesson we will review a procedure for decomposing a rational function into simpler rational functions to which you can apply the basic integration formulas.

A review of partial fraction decomposition:

1. Distinct Linear Factors

$$\frac{P(x)}{Q(x)} = \frac{A_1}{x - a_1} + \frac{A_2}{x - a_2} + \cdots + \frac{A_n}{x - a_n}$$

2. Repeated Linear Factors

$$\frac{A_1}{x - a} + \frac{A_2}{(x - a)^2} + \cdots + \frac{A_n}{(x - a)^n}$$

3. Distinct Quadratic Factors

$$\frac{Ax + B}{ax^2 + bx + c}$$

Finding a Partial Fraction Decomposition

$$\frac{x - 13}{2x^2 - 7x + 3}$$

Finding an Integral with Partial Fractions

- Find

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

Finding Three Partial Fractions

- Find the general solution to

$$\frac{dy}{dx} = \frac{6x^2 - 8x - 4}{(x^2 - 4)(x - 1)}$$