

Recall: Integration by Parts (IBP)**How to decide which is u and which is dv ? L I A T E**

$$\int u \, dv = uv - \int v \, du$$

ex. $\int_0^1 \sin^{-1} x \, dx$

ex. $\int \frac{dx}{1+4x^2}$

Compare and contrast: $\int \frac{dx}{4+x^2}$

$$\text{ex. } \int \frac{5x-4}{2x^2+x-1} dx$$

Why won't u -sub work in this case?

Foundation Topic: Adding Rational Functions

$$\frac{1}{x+3} + \frac{1}{x-5} =$$

To express rational function as a sum of two fractions, put _____ as place markers:

New Integration Tool: Partial Fractions

Sometimes, to integrate a _____ function, it must be expressed as

_____.

$$\text{ex. } \int \frac{2x-2}{(x+3)(x-5)} dx$$

ex. $\int \frac{7x-23}{x^2-7x+10} dx$

Do: $\int \frac{9x-13}{x^2+x-12} dx$

Do: factor denominator $2x^2 + x - 1 = (\quad) (\quad)$

Do: $\int e^{7x} dx$

ex. $\int \frac{1}{2x+1} dx$

now, let's integrate: $\int \frac{5x-4}{2x^2+x-1} dx$

What happens when there are more than two factors in denominator?

ex. $\int \frac{x-5}{2x^3+7x^2-4x} dx$