

Last Time: Partial Fractions

Sometimes, to integrate a **rational** function, express it as *partial* fraction then solve for constants.

ex. $\int \frac{-14x+17}{10x^2+11x-6} dx$

Recall: What happens when there are more than two factors in denominator

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

ex. Expand $\frac{2x^2+9x+8}{(x+2)^2(x+1)}$ to 3 terms using partial fractions technique.

Recall: $(\arctan x)' = \frac{1}{1+x^2}$ **then:**

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

Check with differentiation:

What happens when denominator doesn't fully factor?

ex. $\int \frac{x^2 - 2x - 3}{(x^2 + 1)(x - 1)} dx$

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