

Integrating Rational Functions

1. $\int \frac{1}{x} dx$ $\int \frac{4}{x+7} dx$ $\int \frac{1}{3x+2} dx$

2. How would you go about integrating the rational functions with constants in the numerator and a linear polynomial in the denominator?

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

4. How would you go about integrating the rational functions with an x in the numerator and a quadratic (that looks like $ax^2 + b$) in the denominator?

Important derivative!!! (that you may have forgotten, but shouldn't have since it is my favorite function)

$$\frac{d}{du} \arctan(u) = \frac{1}{u^2 + 1}.$$

5. $\int \frac{2}{9x^2+1} dx$ $\int \frac{1}{x^2+4} dx$

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