

Fundamental Rules of Integration

$$\int x^n dx = \frac{x^{(n+1)}}{(n+1)} + C$$

- Add 1 to the exponent
- Divide by the new exponent (n+1)
- Add C for some possible constant. If you recall, when you take the derivative: constants go to zero. C is only added on indefinite integrals (no specific limit of integration)

$$\int e^x dx = e^x + C$$

- Recall that the derivative of $e^x dx$ is e^x
- Think in terms of the anti-derivative... what derivative would give you the value you are integrating

$$\int \frac{1}{x} dx = \ln|x| + C$$

- Think in terms of anti-derivative, the derivative of what gives you $\frac{1}{x}$
- The absolute is there due to the fact that you cannot take the ln of a negative

$$\int \sin x dx = -\cos x + C$$

- Think in terms of anti-derivative