

Notecards Integration

1	$-\int_a^b f(x)dx$	$-\int_a^b f(x)dx = \int_b^a f(x)dx$
2	$\int_a^a f(x)dx$	$\int_a^a f(x)dx = 0$
3	Power Rule: $\int x^n dx$	$\int x^n dx = \frac{x^{n+1}}{n+1} + C$
4	$\int \frac{1}{x} dx$	$\int \frac{1}{x} dx = \ln x + C$
5	$\int \sin x dx$	$\int \sin x dx = -\cos x + C$
6	$\int \cos x dx$	$\int \cos x dx = \sin x + C$
7	$\int \sec^2 x dx$	$\int \sec^2 x dx = \tan x + C$
8	$\int \csc^2 x dx$	$\int \csc^2 x dx = -\cot x + C$
9	$\int \sec x \tan x dx$	$\int \sec x \tan x dx = \sec x + C$
10	$\int \csc x \cot x dx$	$\int \csc x \cot x dx = -\csc x + C$
11	$\int e^x dx$	$\int e^x dx = e^x + C$
12	What is the First Fundamental Theorem of Calculus? $\frac{d}{dx} \left[\int_{\text{constant}}^{f(x)} f(t) dt \right]$	$\frac{d}{dx} \left[\int_{\text{constant}}^{f(x)} f(t) dt \right] = f(f(x)) \cdot f'(x)$ You plug $f(x)$ into $f(t)$ and multiply by the derivative of $f(x)$.

13	Displacement vs Distance	Displacement: How far you are from “home” $\int v(t)dt$ Distance: How far you have traveled. $\int v(t) dt$
14	$\int \tan x \, dx$	$\int \tan x \, dx = \ln \sec x + C$
15	$\int \cot x \, dx$	$\int \cot x \, dx = \ln \sin x + C$
16	$\int \sec x \, dx$	$\int \sec x \, dx = \ln \sec x + \tan x + C$
17	$\int \csc x \, dx$	$\int \csc x \, dx = \ln \csc x - \cot x + C$
18	$\int \frac{1}{\sqrt{1-x^2}} dx$	$\int \frac{1}{\sqrt{1-x^2}} dx = \sin^{-1}x + C$
19	$\int \frac{1}{x^2+1} dx$	$\int \frac{1}{x^2+1} dx = \tan^{-1}x + C$