

INTEGRALS YOU SHOULD KNOW

Memorize these formulas. Do NOT use this sheet as a reference.

1. $\int dx = x + c$ because $\frac{d}{dx}(x) = 1$
2. $\int x^n dx = \frac{x^{n+1}}{n+1} + c, \quad n \neq -1$ because $\frac{d}{dx}\left(\frac{x^{n+1}}{n+1}\right) = x^n$
3. $\int \frac{1}{x} dx = \ln|x| + c$ because $\frac{d}{dx}(\ln x) = \frac{1}{x}$
4. $\int e^x dx = e^x + c$ because $\frac{d}{dx}(e^x) = e^x$
5. $\int \cos x dx = \sin x + c$ because $\frac{d}{dx}(\sin x) = \cos x$
6. $\int \sin x dx = -\cos x + c$ because $\frac{d}{dx}(\cos x) = -\sin x$
7. $\int \sec^2 x dx = \tan x + c$ because $\frac{d}{dx}(\tan x) = \sec^2 x$
8. $\int \csc^2 x dx = -\cot x + c$ because $\frac{d}{dx}(\cot x) = -\csc^2 x$
9. $\int \sec x \tan x dx = \sec x + c$ because $\frac{d}{dx}(\sec x) = \sec x \tan x$
10. $\int \csc x \cot x dx = -\csc x + c$ because $\frac{d}{dx}(\csc x) = -\csc x \cot x$
11. $\int \frac{1}{\sqrt{1-x^2}} dx = \sin^{-1} x + c$ because $\frac{d}{dx}(\sin^{-1} x) = \frac{1}{\sqrt{1-x^2}}$
12. $\int \frac{1}{1+x^2} dx = \tan^{-1} x + c$ because $\frac{d}{dx}(\tan^{-1} x) = \frac{1}{1+x^2}$
13. $\int \frac{1}{x\sqrt{x^2-1}} dx = \sec^{-1} x + c$ because $\frac{d}{dx}(\sec^{-1} x) = \frac{1}{x\sqrt{x^2-1}}$
14. $\int \sec x dx = \ln|\sec x + \tan x| + c$
15. $\int \csc x dx = -\ln|\csc x + \cot x| + c$