Basic Rules for Derivatives

1. $[f(x)+g(x)]' = f'(x)+g'(x)$
2. $[f(x)-g(x)]' = f'(x)-g'(x)$
3. $[cf(x)]' = cf'(x)$
4. $[f(x)g(x)]' = f'(x)g(x)+f(x)g'(x)$
5. $\left[\dfrac{f(x)}{g(x)}\right]' = \dfrac{f'(x)g(x)-f(x)g'(x)}{[g(x)]^2}$
6. $[f(g(x))]' = f'(g(x))g'(x)$

Basic Derivatives

1. $(c)' = 0$
2. $(x)' = 1$
3. $(x^r)' = rx^{r-1}$, for any real number r
4. $(e^x)' = e^x$
5. $(a^x)' = a^x \ln a$
6. $(\ln x)' = \dfrac{1}{x}$
7. $(\ln|x|)' = \dfrac{1}{x}$
8. $(\log_a x)' = \dfrac{1}{\ln a}\dfrac{1}{x}$
9. $(\sin x)' = \cos x$
10. $(\cos x)' = -\sin x$
11. $(\tan x)' = \sec^2 x$
12. $(\sec x)' = \sec x \tan x$
13. $(\csc x)' = -\csc x \cot x$
14. $(\cot x)' = -\csc^2 x$
15. $(\arcsin x)' = \dfrac{1}{\sqrt{1-x^2}}$
16. $(\arccos x)' = -\dfrac{1}{\sqrt{1-x^2}}$
17. $(\arctan x)' = \dfrac{1}{1+x^2}$
18. $(\operatorname{arcsec} x)' = \dfrac{1}{|x|\sqrt{x^2-1}}$
19. $(\operatorname{arccsc} x)' = -\dfrac{1}{|x|\sqrt{x^2-1}}$
20. $(\operatorname{arccot} x)' = -\dfrac{1}{1+x^2}$

Basic Rules for Indefinite Integrals

1. $\displaystyle\int [f(x) + g(x)]\,dx = \int f(x)\,dx + \int g(x)\,dx$

2. $\displaystyle\int [f(x) - g(x)]\,dx = \int f(x)\,dx - \int g(x)\,dx$

3. $\displaystyle\int c\,f(x)\,dx = c\int f(x)\,dx$

Basic Indefinite Integrals

1. $\displaystyle\int 1\,dx = x + C$

2. $\displaystyle\int x^r\,dx = \frac{x^{r+1}}{r+1} + C \quad \text{when } r \neq -1$

3. $\displaystyle\int \frac{1}{x}\,dx = \ln|x| + C$

4. $\displaystyle\int e^x\,dx = e^x + C$

5. $\displaystyle\int a^x\,dx = \frac{a^x}{\ln a} + C$

6. $\displaystyle\int \sin x\,dx = -\cos x + C$

7. $\displaystyle\int \cos x\,dx = \sin x + C$

8. $\displaystyle\int \sec^2 x\,dx = \tan x + C$

9. $\displaystyle\int \sec x \tan x\,dx = \sec x + C$

10. $\displaystyle\int \csc^2 x\,dx = -\cot x + C$

11. $\displaystyle\int \csc x \cot x\,dx = -\csc x + C$

12. $\displaystyle\int \frac{1}{\sqrt{1-x^2}}\,dx = \arcsin x + C$

13. $\displaystyle\int \frac{1}{1+x^2}\,dx = \arctan x + C$

14. $\displaystyle\int \frac{1}{|x|\sqrt{x^2-1}}\,dx = \operatorname{arcsec} x + C$