General Formulas

1. $\dfrac{d}{dx}[c] = 0$

2. $\dfrac{d}{dx}[cf(x)] = c'f(x)$

3. $\dfrac{d}{dx}[f(x) \pm g(x)] = f'(x) \pm g'(x)$

4. $\dfrac{d}{dx}[x^n] = nx^{n-1}$

5. $\dfrac{d}{dx}[f(x)g(x)] = f(x)g'(x) + g(x)f'(x)$

6. $\dfrac{d}{dx}\left[\dfrac{f(x)}{g(x)}\right] = \dfrac{g(x)f'(x) - f(x)g'(x)}{[g(x)]^2}$

7. $\dfrac{d}{dx}[f(g(x))] = f'(g(x))g'(x)$

Exponential and Logarithmic Functions

8. $\dfrac{d}{dx}[e^x] = e^x$

9. $\dfrac{d}{dx}[a^x] = a^x \ln a$

10. $\dfrac{d}{dx}[\ln|x|] = \dfrac{1}{x}$

11. $\dfrac{d}{dx}[\log_a x] = \dfrac{1}{x \ln a}$

Trigonometric Functions

12. $\dfrac{d}{dx}[\sin x] = \cos x$

13. $\dfrac{d}{dx}[\cos x] = -\sin x$

14. $\dfrac{d}{dx}[\tan x] = \sec^2 x$

15. $\dfrac{d}{dx}[\cot x] = -\csc^2 x$

16. $\dfrac{d}{dx}[\sec x] = \sec x \tan x$

17. $\dfrac{d}{dx}[\csc x] = -\csc x \cot x$

Inverse Trigonometric Functions

18. $\dfrac{d}{dx}\left[\sin^{-1} x\right] = \dfrac{1}{\sqrt{1 - x^2}}$

19. $\dfrac{d}{dx}\left[\cos^{-1} x\right] = -\dfrac{1}{\sqrt{1 - x^2}}$

20. $\dfrac{d}{dx}\left[\tan^{-1} x\right] = \dfrac{1}{1 + x^2}$

21. $\dfrac{d}{dx}\left[\cot^{-1} x\right] = -\dfrac{1}{1 + x^2}$

22. $\dfrac{d}{dx}\left[\sec^{-1} x\right] = \dfrac{1}{x\sqrt{x^2 - 1}}$

23. $\dfrac{d}{dx}\left[\csc^{-1} x\right] = -\dfrac{1}{x\sqrt{x^2 - 1}}$