Rules and Derivatives of Common Functions

1. $\frac{d}{dx}(C) = 0$	2. $\frac{d}{dx}\,x = 1$
3. $\frac{d}{dx}(x^n) = nx^{n-1}$	4. $\frac{d}{dx}(\mathbf{Cf(x)}) = \mathbf{Cf}\,'\mathbf{(x)}$
5. $\frac{d}{dx}\big(f(x) \pm g(x)\big) = f'(x) \pm g'(x)$	6. $\frac{d}{dx}(a^x) = a^x \ln(a)$
7. $\frac{d}{dx}\big(f(x) * g(x)\big) = f'(x) * g(x) + g'(x) * f(x)$	8. $\frac{d}{dx}(e^x) = e^x$
9. $\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) = \frac{f'(x)*g(x) - g'(x)*f(x)}{(g(x))^2}$	10. $\frac{d}{dx}(\ln\|x\|) = \frac{1}{x}$
11. $\frac{d}{dx}(f(g(x))) = f'\big(g(x)\big) * g'(x)$	12. $\frac{d}{dx}(\ln\|f(x)\|) = \frac{f'(x)}{f(x)}$
13. $\frac{d}{dx}\sin(x) = \cos(x)$	14. $\frac{d}{dx}\mathbf{csc(x)} = -\mathbf{csc(x)cot(x)}$
15. $\frac{d}{dx}\cos(x) = -\sin(x)$	16. $\frac{d}{dx}\mathbf{sec(x)} = \mathbf{sec(x)tan(x)}$
17. $\frac{d}{dx}\tan(x) = sec^2(x)$	18. $\frac{d}{dx}\mathbf{cot(x)} = -csc^2(x)$
19. $\frac{d}{dx}sin^{-1}(x) = \frac{1}{\sqrt{1-x^2}}$	20. $\frac{d}{dx}csc^{-1}(x) = -\frac{1}{x\sqrt{x^2-1}}$
21. $\frac{d}{dx}cos^{-1}(x) = -\frac{1}{\sqrt{1-x^2}}$	22. $\frac{d}{dx}sec^{-1}(x) = \frac{1}{x\sqrt{x^2-1}}$
23. $\frac{d}{dx}tan^{-1}(x) = \frac{1}{1+x^2}$	24. $\frac{d}{dx}cot^{-1}(x) = -\frac{1}{1+x^2}$