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. $(\operatorname{arccot} x)' = -\dfrac{1}{1 + x^2}$