

-
1. $\frac{d}{dx}(f + g) = \frac{df}{dx} + \frac{dg}{dx}$
 2. $\frac{d}{dx}(cf) = c\frac{df}{dx}$
 3. $\frac{d}{dx}(fg) = f\frac{dg}{dx} + g\frac{df}{dx}$
 4. $\frac{d}{dx}\left(\frac{f}{g}\right) = \frac{g\frac{df}{dx} - f\frac{dg}{dx}}{g^2}$
 5. $\frac{d}{dx}(c) = 0$
 6. $\frac{d}{dx}(x^\alpha) = \alpha x^{\alpha-1}$
 7. $\frac{d}{dx}\sin(x) = \cos(x)$
 8. $\frac{d}{dx}\cos(x) = -\sin(x)$
 9. $\frac{d}{dx}\tan(x) = \sec^2(x)$
 10. $\frac{d}{dx}\sec(x) = \sec(x)\tan x$
 11. $\frac{d}{dx}\csc(x) = -\csc(x)\cot(x)$
 12. $\frac{d}{dx}\cot(x) = -\csc^2(x)$
 13. $\frac{d}{dx}\sinh(x) = \cosh(x)$
 14. $\frac{d}{dx}\cosh(x) = \sinh(x)$
 15. $\frac{d}{dx}\tanh(x) = \operatorname{sech}^2(x)$
 16. $\frac{d}{dx}\operatorname{sech}(x) = -\operatorname{sech}(x)\tanh x$
 17. $\frac{d}{dx}\operatorname{csch}(x) = -\operatorname{csch}(x)\coth(x)$
 18. $\frac{d}{dx}\coth(x) = -\operatorname{csch}^2(x)$
 19. $\frac{d}{dx}(c^x) = c^x \ln(c)$
 20. $\frac{d}{dx}(\log_a(x)) = \frac{1}{\ln(a)x}$
 21. $\frac{d}{dx}\sinh^{-1}x = \frac{1}{\sqrt{1+x^2}}$
 22. $\frac{d}{dx}\cosh^{-1}x = \frac{1}{\sqrt{x^2-1}}, \text{ for } x > 1$
 23. $\frac{d}{dx}\tanh^{-1}x = \frac{1}{\sqrt{1-x^2}}, \text{ for } |x| < 1$
 24. $\frac{d}{dx}\coth^{-1}x = \frac{1}{\sqrt{1-x^2}}, \text{ for } |x| > 1$
 25. $\frac{d}{dx}\operatorname{sech}^{-1}x = \frac{1}{x\sqrt{1-x^2}}, \text{ for } 0 < x < 1$
 26. $\frac{d}{dx}\operatorname{csch}^{-1}x = \frac{1}{|x|\sqrt{1+x^2}}, \text{ for } x \neq 0$
 27. $(f \circ g)'(x) = f'(g(x))g'(x)$
 28. $\frac{dy}{dx} = \frac{dy}{du} \frac{du}{dx}$
 29. $\frac{d}{dx}\sin^{-1}(x) = \frac{1}{\sqrt{1-x^2}}, \text{ for } |x| < 1$
 30. $\frac{d}{dx}\cos^{-1}(x) = \frac{-1}{\sqrt{1-x^2}} \text{ for } |x| < 1$
 31. $\frac{d}{dx}\tan^{-1}(x) = \frac{1}{1+x^2}$
 32. $\frac{d}{dx}\cot^{-1}(x) = \frac{-1}{1+x^2}$
 33. $\frac{d}{dx}\sec^{-1}(x) = \frac{1}{|x|\sqrt{x^2-1}} \text{ for } |x| > 1$
 34. $\frac{d}{dx}\csc^{-1}(x) = \frac{-1}{|x|\sqrt{x^2-1}} \text{ for } |x| < 1$

$$35. \frac{d}{dx} \int_{u(x)}^{v(x)} f(t) dt = f(v(x))v'(x) - f(u(x))u'(x)$$

$$36. \int_a^b f'(t) dt = f(b) - f(a)$$

$$37. \sin^2 x + \cos^2 x = 1$$

$$38. \cosh^2 x - \sinh^2 x = 1$$

$$39. \sin(x+y) = \sin(x)\cos(y) + \cos(x)\sin(y)$$

$$40. \cos(x+y) = \cos(x)\cos(y) - \sin(x)\sin(y)$$

$$41. \sin mx \sin nx = \frac{\cos(m-n)x - \cos(m+n)x}{2}$$

$$42. \sin mx \cos nx = \frac{\sin(m-n)x + \sin(m+n)x}{2}$$

$$43. \cos mx \cos nx = \frac{\cos(m-n)x + \cos(m+n)x}{2}$$

$$44. \sinh(2x) = 2 \sinh(x) \cosh(x)$$

$$45. \cosh(2x) = \cosh^2 x + \sinh^2 x$$

$$46. \cos^2(x) = \frac{1 + \cos(2x)}{2}$$

$$47. \sin^2(x) = \frac{1 - \cos(2x)}{2}$$

$$48. \sin(0) = \cos(\pi/2) = 0$$

$$49. \cos(0) = \sin(\pi/2) = 1$$

$$50. \sin(\pi/6) = \cos(\pi/3) = 1/2$$

$$51. \cos(\pi/6) = \sin(\pi/3) = \sqrt{3}/2$$

$$52. \sin(\pi/4) = \cos(\pi/4) = \sqrt{2}/2$$

$$53. \text{Law of cosines: } c^2 = a^2 + b^2 - 2ab \cos(C)$$

$$54. \text{Law of sines: } \frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c}$$