

导数公式:

$$(\tan x)' = \sec^2 x$$

$$(\cot x)' = -\csc^2 x$$

$$(\sec x)' = \sec x \cdot \tan x$$

$$(\csc x)' = -\csc x \cdot \cot x$$

$$(a^x)' = a^x \ln a$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(\arcsin x)' = \frac{1}{\sqrt{1-x^2}}$$

$$(\arccos x)' = -\frac{1}{\sqrt{1-x^2}}$$

$$(\arctan x)' = \frac{1}{1+x^2}$$

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

基本积分表:

$$1. \int \frac{dx}{ax+b} = \frac{1}{a} \ln|ax+b| + C$$

$$2. \int (ax+b)^\mu dx = \frac{1}{a(\mu+1)} (ax+b)^{\mu+1} + C \quad (\mu \neq -1)$$

$$3. \int \frac{x}{ax+b} dx = \frac{1}{a^2} (ax+b - b \ln|ax+b|) + C$$

$$5. \int \frac{dx}{x(ax+b)} = -\frac{1}{b} \ln \left| \frac{ax+b}{x} \right| + C$$

$$6. \int \frac{dx}{x^2(ax+b)} = -\frac{1}{bx} + \frac{a}{b^2} \ln \left| \frac{ax+b}{x} \right| + C$$

$$10. \int \sqrt{ax+b} dx = \frac{2}{3a} \sqrt{(ax+b)^3} + C$$

$$19. \int \frac{dx}{x^2+a^2} = \frac{1}{a} \arctan \frac{x}{a} + C$$

$$21. \int \frac{dx}{x^2-a^2} = \frac{1}{2a} \ln \left| \frac{x-a}{x+a} \right| + C$$

$$23. \int \frac{x}{ax^2+b} dx = \frac{1}{2a} \ln|ax^2+b| + C$$

$$24. \int \frac{x^2}{ax^2+b} dx = \frac{x}{a} - \frac{b}{a} \int \frac{dx}{ax^2+b}$$

$$31. \int \frac{dx}{\sqrt{x^2 + a^2}} = \operatorname{arsh} \frac{x}{a} + C_1 = \ln(x + \sqrt{x^2 + a^2}) + C$$

$$32. \int \frac{dx}{\sqrt{(x^2 + a^2)^3}} = \frac{x}{a^2 \sqrt{x^2 + a^2}} + C$$

$$33. \int \frac{x}{\sqrt{x^2 + a^2}} dx = \sqrt{x^2 + a^2} + C$$

$$34. \int \frac{x}{\sqrt{(x^2 + a^2)^3}} dx = -\frac{1}{\sqrt{x^2 + a^2}} + C$$

$$35. \int \frac{x^2}{\sqrt{x^2 + a^2}} dx = \frac{x}{2} \sqrt{x^2 + a^2} - \frac{a^2}{2} \ln(x + \sqrt{x^2 + a^2}) + C$$

$$39. \int \sqrt{x^2 + a^2} dx = \frac{x}{2} \sqrt{x^2 + a^2} + \frac{a^2}{2} \ln(x + \sqrt{x^2 + a^2}) + C$$

$$43. \int \frac{\sqrt{x^2 + a^2}}{x} dx = \sqrt{x^2 + a^2} + a \ln \frac{\sqrt{x^2 + a^2} - a}{|x|} + C$$

$$44. \int \frac{\sqrt{x^2 + a^2}}{x^2} dx = -\frac{\sqrt{x^2 + a^2}}{x} + \ln(x + \sqrt{x^2 + a^2}) + C$$

$$47. \int \frac{x}{\sqrt{x^2 - a^2}} dx = \sqrt{x^2 - a^2} + C$$

$$53. \int \sqrt{x^2 - a^2} dx = \frac{x}{2} \sqrt{x^2 - a^2} - \frac{a^2}{2} \ln|x + \sqrt{x^2 - a^2}| + C$$

$$57. \int \frac{\sqrt{x^2 - a^2}}{x} dx = \sqrt{x^2 - a^2} - a \arccos \frac{a}{|x|} + C$$

$$59. \int \frac{dx}{\sqrt{a^2 - x^2}} = \arcsin \frac{x}{a} + C$$

$$61. \int \frac{x}{\sqrt{a^2 - x^2}} dx = -\sqrt{a^2 - x^2} + C$$

$$67. \int \sqrt{a^2 - x^2} dx = \frac{x}{2} \sqrt{a^2 - x^2} + \frac{a^2}{2} \arcsin \frac{x}{a} + C$$

$$83. \int \sin x dx = -\cos x + C$$

$$84. \int \cos x dx = \sin x + C$$

$$85. \int \tan x dx = -\ln |\cos x| + C$$

$$86. \int \cot x dx = \ln |\sin x| + C$$

$$87. \int \sec x dx = \ln \left| \tan \left( \frac{\pi}{4} + \frac{x}{2} \right) \right| + C = \ln |\sec x + \tan x| + C$$

$$88. \int \csc x dx = \ln \left| \tan \frac{x}{2} \right| + C = \ln |\csc x - \cot x| + C$$

$$89. \int \sec^2 x dx = \tan x + C$$

$$90. \int \csc^2 x dx = -\cot x + C$$

$$91. \int \sec x \tan x dx = \sec x + C$$

$$92. \int \csc x \cot x dx = -\csc x + C$$

$$122. \int a^x dx = \frac{1}{\ln a} a^x + C$$

$$132. \int \ln x dx = x \ln x - x + C$$

$$133. \int \frac{dx}{x \ln x} = \ln |\ln x| + C$$

$$134. \int x^n \ln x dx = \frac{1}{n+1} x^{n+1} \left( \ln x - \frac{1}{n+1} \right) + C$$

$$135. \int (\ln x)^n dx = x(\ln x)^n - n \int (\ln x)^{n-1} dx$$