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Allowed aid: Table of antiderivatives*

Powers and logarithms

$$x^a \quad \begin{cases} \frac{1}{a+1}x^{a+1} & a \neq -1 \\ \ln|x| & a = -1 \end{cases}$$

$$x^\alpha \ln(x) \quad (\alpha + 1)^{-1}x^{\alpha+1} \ln(x) - (\alpha + 1)^{-2}x^{\alpha+1}$$

Exponents

$$\begin{array}{ll} e^x & e^x \\ a^x & (\ln a)^{-1}a^x \\ xe^x & (x-1)e^x \\ e^x & e^x \end{array}$$

Trigonometric functions

$$\begin{array}{ll} \cos(x) & \sin(x) \\ \sin(x) & -\cos(x) \\ \tan(x) & -\ln|\cos(x)| \\ \cot(x) & \ln|\sin(x)| \\ \sec^2(x) & \tan(x) \\ \csc^2(x) & -\cot(x) \\ \sec(x) & \ln(\sec(x) + \tan(x)) \\ \csc(x) & -\ln(\csc(x) + \cot(x)) \end{array}$$

* Without $+C$ in the right-hand expression.

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Hyperbolic functions

| | |
|-----------------|-------------------------|
| $\cosh(x)$ | $\sinh(x)$ |
| $\sinh(x)$ | $\cosh(x)$ |
| $\tanh(x)$ | $\ln \cosh(x)$ |
| $\coth(x)$ | $\ln \sinh(x) $ |
| $\cosh^{-2}(x)$ | $\tanh(x)$ |
| $\sinh^{-2}(x)$ | $-\coth(x)$ |
| $\cosh^{-1}(x)$ | $2 \arctan(\tanh(x/2))$ |
| $\sinh^{-1}(x)$ | $\ln(\tanh(x/2))$ |

Irrational functions

| | |
|--------------------------|-------------------------------------------------------|
| $\frac{1}{1+x^2}$ | $\arctan(x)$ |
| $\frac{1}{1-x^2}$ | $\frac{1}{2} \ln \frac{ 1-x }{ 1+x }$ |
| $\frac{1}{\sqrt{1-x^2}}$ | $\arcsin(x)$ |
| $\frac{1}{\sqrt{1+x^2}}$ | $\ln(x + \sqrt{1+x^2})$ |
| $\frac{1}{\sqrt{x^2-1}}$ | $\ln(x + \sqrt{x^2-1})$ |
| $\sqrt{1-x^2}$ | $\frac{1}{2} [x\sqrt{1-x^2} + \arcsin(x)]$ |
| $\sqrt{1+x^2}$ | $\frac{1}{2} [x\sqrt{1+x^2} + \ln(x + \sqrt{1+x^2})]$ |
| $\sqrt{x^2-1}$ | $\frac{1}{2} [x\sqrt{x^2-1} - \ln(x + \sqrt{x^2-1})]$ |