Contents

Expression for integration of hyperbolic function sinhx

- $$\int sinhxdx = coshx + C$$

Derivation for expression for integration of hyperbolic function sinhx

- $$\int sinhxdx = \int \frac{1}{2}(e^x - e^{-x})dx$$
- $$= \frac{1}{2}(e^x + e^{-x}) + C$$
- $$\int sinhxdx = coshx + C$$

Expression for integration of hyperbolic function coshx

- $$\int coshxdx = sinhx + C$$

Derivation for expression for integration of hyperbolic function coshx

- $$\int coshxdx = \int \frac{1}{2}(e^x + e^{-x})dx$$
- $$= \frac{1}{2}(e^x - e^{-x}) + C$$
- $$\int coshxdx = sinhx + C$$

Expression for integration of hyperbolic function tanhx

- $$\log(coshx) + C$$

Derivation for expression for integration of hyperbolic function tanhx

- $$\int tanhxdx = \int \frac{sinhx}{coshx}dx$$
- $$z = coshx$$
- $$\int \frac{dz}{z}$$
- $$\log(z) + C$$
- $$\log(coshx) + C$$

Expression for integration of hyperbolic function cothx

- $$\int cothx = \log(sinhx) + C$$

Derivation for expression for integration of hyperbolic function cothx

- $$\int cothx = \int \frac{coshx}{sinhx}dx$$
- $$\int cothx = \log(sinhx) + C$$

Expression for integration of hyperbolic function cosechx

- $$\int cosechxdx = \log(tanh(\frac{x}{2})) + C$$

Derivation for expression for integration of hyperbolic function cosechx

- $$\int cosechxdx = \int \frac{1}{sinhx}dx$$

- $$\int \frac{2}{e^x - e^{-x}} dx$$
- $$\int \frac{2e^x}{e^{2x} - 1} dx$$
- $$y = e^x$$
- $$2 \int \frac{1}{y^2 - 1} dy$$
- $$= \log(\frac{y-1}{y+1}) + C$$
- $$= \log(\frac{e^x - 1}{e^x + 1}) + C$$
- $$\int cosechx dx = \log(tanh(\frac{x}{2})) + C$$

Expression for integration of hyperbolic function sechx

- $$\int sechx dx = 2 \tan^{-1}(tanh(\frac{x}{2})) + C$$

Derivation for expression for integration of hyperbolic function sechx

- $$\int sechx dx = \int \frac{1}{coshx} dx$$
- $$= \frac{dx}{cosh^2(\frac{x}{2}) + sinh^2(\frac{x}{2})}$$
- $$= \int \frac{sech^2 \frac{x}{2}}{1 + tanh^2 \frac{x}{2}} dx$$
- $$z = tanh \frac{x}{2}$$
- $$= 2 \int \frac{dz}{1 + z^2}$$

- $$= 2tan^{-1}z + C$$
- $$\int sechxdx = 2\tan^{-1}(tanh(\frac{x}{2})) + C$$

Expression for integration of hyperbolic function square of sechx

$$\int sech^{x}dx = tanhx$$

Expression for integration of hyperbolic function square of cosechx

$$\int cosech^{x}dx = -cothx$$

Expression for integration of hyperbolic function sechx times tanhx

$$\int sechxtanhxdx = -sechx$$

Expression for integration of hyperbolic function cosechx times cothx

$$\int cosechxcothx = -cosechx$$