Useful Integrals

$$\int \frac{du}{\sqrt{a^2+u^2}} = \ln\left(u+\sqrt{a^2+u^2}\right)$$

$$\int \frac{u\,du}{\sqrt{a^2+u^2}} = \sqrt{a^2+u^2}$$

$$\int \frac{du}{a^2+u^2} = \frac{1}{a}\tan^{-1}\left(\frac{u}{a}\right)$$

$$\int \frac{u\,du}{a^2+u^2} = \tfrac{1}{2}\ln\left(a^2+u^2\right)$$

$$\int \frac{du}{(a^2+u^2)^{3/2}} = \frac{u}{a^2\sqrt{a^2+u^2}}$$

$$\int \frac{u\,du}{(a^2+u^2)^{3/2}} = -\frac{1}{\sqrt{a^2+u^2}}$$

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