

2. Integration of

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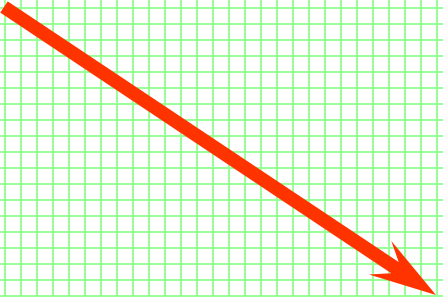
expressions containing
trigonometric functions.

Let the **integrand function** be the **product of sine and cosine** in **positive integer powers of different parity**, for example

$$\int \sin^{2m} x \cdot \cos^{2n+1} x dx .$$

$$\cos X = \frac{1 - \operatorname{tg}^2 \frac{X}{2}}{1 + \operatorname{tg}^2 \frac{X}{2}}$$

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$$\cos X = \frac{1 - t^2}{1 + t^2}$$

Prove the table integral:

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$$\int \frac{dx}{\sin x} = \ln \left| \operatorname{tg} \frac{x}{2} \right| + C.$$