Arbeidshefte

Integralregning
Trigonometri

Formel

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

Formel

$$\begin{aligned}
\int \tan x \ dx &= \int \frac{\sin x}{\cos x} \ dx \\
MR: &\left[u = \cos x, u' = -\sin x\right] \\
&= \int \frac{\sin x}{u} \cdot \frac{1}{-\sin x} \ du \\
&= -\int \frac{1}{u} \ du \\
&= -\ln|u| + C \\
&= -\ln|\cos x| + C
\end{aligned}$$

Formel

$$\begin{aligned}
\int \sin^2 x \ dx &= -\sin x \cos x - \int -\cos^2 x \ dx \\
MR: u &= sinx, u' = \cos x, v = -\cos x, v' = \sin x \\
\int \sin^2 x \ dx &= -\sin x \cos x + \int 1 \ dx - \int \sin^2 x \\
2\int \sin^2 x \ dx &= -\sin x \cos x + x + C \\
\int \sin^2 x \ dx &= \frac{1}{2}(-\sin x \cos x + x) + C \\
&= -\frac{1}{2}\sin x \cos x + \frac{1}{2}x + C
\end{aligned}$$

Formel

$$\int \cos^2 x \; dx = \int 1 - \sin^2 x \; dx$$
$$\int \cos^2 x \; dx = x - \int \sin^2 x \; dx$$
$$\int \cos^2 x \; dx = x - \left(-\frac{1}{2}(\sin x \cos x + x) \right) + C$$
$$= \frac{1}{2} \sin x \cos x + \frac{1}{2} x + C$$

Formel

$$\int \sin x \cdot \cos x \; dx = \int u \cdot \sin x \cdot \left(-\frac{1}{\sin x} \right) dx$$
$$MR : \left[u = \cos x, u' = -\sin x \right]$$
$$= -\int u \; dx$$
$$= -\frac{1}{2} u^2 + C$$
$$= -\frac{1}{2} \cos^2 x + C$$

$$\int \sin x \cdot \cos x \; dx = \int u \cdot \cos x \cdot \left(\frac{1}{\cos x} \right) dx$$
$$MR : \left[u = \sin x, u' = \cos x \right]$$
$$= \int u \; dx$$
$$= \frac{1}{2} \sin^2 x + C$$

$$\frac{1}{2} \sin^2 x + C = \frac{1}{2}(1 - \cos^2 x) + C$$
$$= -\frac{1}{2} \cos^2 x + \frac{1}{2} + C$$
$$= -\frac{1}{2} \cos^2 x + C$$

Oppgave 1

1) $\int 2 \cdot \cos x \ dx =$

2) $\int 6\pi \sin(2\pi x) \ dx =$

3) $\int (2x - \cos x) \ dx =$

Oppgave 2

1) $\int 4\cos(2x)\ dx =$

2) $\int \frac{1}{2}\sin(\pi \cdot x)\ dx =$

3) $\int -\sin(3x - \pi)\ dx =$

Oppgave 3

1) $\int 2 \cdot \cos(2x - 24) + 12 \; dx =$

2) $\int \cos(x) \cdot e^{\sin x} \; dx =$

3) $\int x \cdot \cos(x^2 + 1) \; dx =$

Oppgave 4

1) $\int (2x+1) \cdot \sin x \ dx =$

2) $\int x \cdot \cos x \ dx =$

Oppgave 5

1) $\int \sin x \cdot e^x \ dx =$

2) $\int \cos x \cdot e^x \ dx =$

Oppgave 6

1) $\int 2 \cdot \sin^2 x \; dx =$

2) $\int \frac{\cos x}{\sin x + 1} \; dx =$

Oppgave 7

1) $\int_0^{\pi/2} (\sin x + 2)\ dx =$

2) $\int_0^{\pi/2} \cos(x)\ dx =$

3) $\int_0^{2} \cos(\pi x)\ dx =$

Oppgave 8

1) $\int_0^2 \sin(\frac{\pi}{3}x)\ dx =$

2) $\int_0^{\pi} \sin x\ dx =$

Dette arbeidshefte :

Løsningsforslag :

13. januar 2024