Arbeidshefte
Integralregning
Grunnleggende

$$f'(x) = F(x) \Rightarrow \int F(x) \; dx = f(x) + C$$

$$f(x) = x^2 \Rightarrow f'(x) = 2x \Rightarrow \int 2x \; dx = x^2 + C$$

$$\int a \cdot x^n \; dx = \frac{a}{n+1} \cdot x^{n+1}$$

$$\int e^x \; dx = e^x + C$$

$$\int a^x \; dx = \frac{1}{\ln a} \cdot a^x$$

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

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

Antiderivasjon

$$f'(x) = F(x) \Rightarrow \int F(x) \ dx = f(x) + C$$

$$f(x) = x^2 \Rightarrow f'(x) = 2x \Rightarrow \int 2x \ dx = x^2 + C$$

Oppgave 1

Finn integralene ved å tenke motsatt av derivasjon.

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

2) $\int x \ dx =$

3) $\int 2 \ dx =$

4) $\int x^2 \ dx =$

5) $\int \frac{1}{x} \ dx =$

6) $\int x^5 \ dx =$

7) $\int 3x^2 \ dx =$

8) $\int x^2 + x + 1 \ dx =$

9) $\int e^{2x} \ dx =$

10) $\int \frac{1}{x^2} \ dx =$

11) $\int \pi + x \ dx =$

12) $\int 2e + e^x \ dx =$

Regler

$$\int a \cdot x^n \ dx = \frac{a}{n+1} \cdot x^{n+1}$$

$$\int e^x \ dx = e^x + C$$

$$\int a^x \ dx = \frac{1}{\ln a} \cdot a^x$$

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

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

Oppgave 2

Bruk reglene til å finne integralene.

1) $\int 3x^4 \ dx =$

2) $\int \frac{1}{3}x^3 + \frac{1}{2}x^2 + x + 1 \ dx =$

3) $\int -x^{-3} \ dx =$

4) $\int \sqrt{x} \ dx =$

5) $\int (2x + 2) \ dx =$

Oppgave 3

1) $\int \sqrt[3]{x} \ dx =$

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

3) $\int e^{3x} + e^x + e^2 \ dx =$

4) $\int 2^x \ dx =$

5) $\int \ln 3 \cdot 3^x \ dx =$

6) $\int 3 \sin x + 3 \ dx =$

7) $\int \cos x - 5x \ dx =$

8) $\int e^x - \cos x \ dx =$

FASIT

Oppgave 1

1) $e^x + C$

2) $\frac{1}{2}x^2 + C$

3) $2x + C$

4) $\frac{1}{3}x^3 + C$

5) $\ln x + C$

6) $\frac{1}{6}x^6 + C$

7) $x^3 + C$

8) $\frac{1}{3}x^3 + \frac{1}{2}x^2 + x + C$

9) $\frac{1}{2}e^{2x} + C$

10) $-\frac{1}{x} + C$

11) $\pi x + \frac{1}{2}x^2 + C$

12) $2ex + e^x + C$

Oppgave 2

1) $\frac{3}{5}x^5 + C$

2) $\frac{1}{12}x^4 + \frac{1}{6}x^3 + \frac{1}{2}x^2 + x + C$

3) $\frac{1}{2x^2} + C$

4) $\frac{2}{3}x\sqrt{x} + C$

5) $x^2 + 2x + C$

Oppgave 3

1) $\frac{3}{4}x\sqrt[3]{x} + C$

2) $2e^x + C$

3) $\frac{1}{3}e^{3x} + e^x + e^2x + C$

4) $\frac{2^x}{\ln 2} + C$

5) $3^x + C$

6) $-3\cos x + 3x + C$

7) $\sin x - \frac{5}{2}x^2 + C$

8) $e^x - \sin x + C$