

Veiledningsoppgaver

Oppgave 1.

Regn ut disse ubestemte integralene:

$$\text{a) } \int \frac{4}{4-x} dx \quad \text{b) } \int \frac{4}{4-x^2} dx \quad \text{c) } \int \frac{4x}{4-x^2} dx \quad \text{d) } \int \frac{x^2}{4-x^2} dx$$

Oppgave 2.

Regn ut disse ubestemte integralene:

$$\begin{aligned} \text{a) } \int \frac{1}{1-x^2} dx & \quad \text{b) } \int \frac{2x}{1-x^2} dx & \quad \text{c) } \int \frac{x^2}{1-x^2} dx & \quad \text{d) } \int \frac{x^2 - 2x + 1}{1-x^2} dx \\ \text{e) } \int \frac{1}{(1-x)^2} dx & \quad \text{f) } \int \frac{2x}{(1-x)^2} dx & \quad \text{g) } \int \frac{x^2}{(1-x)^2} dx & \quad \text{h) } \int \frac{x^2 - 2x + 1}{(1-x)^2} dx \end{aligned}$$

Oppgave 3.

Løs de bestemte integralene:

$$\begin{aligned} \text{a) } \int_0^1 x dx & \quad \text{b) } \int_0^1 x^2 dx & \quad \text{c) } \int_0^1 x^3 dx & \quad \text{d) } \int_0^1 e^x dx & \quad \text{e) } \int_0^1 (e^x + e^{-x}) dx \\ \text{f) } \int_{-1}^1 x dx & \quad \text{g) } \int_{-1}^1 x^2 dx & \quad \text{h) } \int_{-1}^1 x^3 dx & \quad \text{i) } \int_{-1}^1 e^x dx & \quad \text{j) } \int_{-1}^1 (e^x + e^{-x}) dx \end{aligned}$$

Oppgave 4.

Løs de bestemte integralene:

$$\begin{aligned} \text{a) } \int_0^1 x e^x dx & \quad \text{b) } \int_0^1 x \ln(x^2 + 1) dx & \quad \text{c) } \int_0^1 \frac{1}{x^2 + 5x + 6} dx & \quad \text{d) } \int_0^1 \frac{1}{x^2 + 4x + 4} dx \\ \text{e) } \int_{-1}^1 x e^x dx & \quad \text{f) } \int_{-1}^1 x \ln(x^2 + 1) dx & \quad \text{g) } \int_{-1}^1 \frac{1}{x^2 + 5x + 6} dx & \quad \text{h) } \int_{-1}^1 \frac{1}{x^2 + 4x + 4} dx \end{aligned}$$

Oppgave 5.

Eksamen MET1180 (Desember 2015) Oppgave 2abc

Regn ut disse ubestemte integralene:

$$\text{a) } \int x e^{1-x^2} dx \quad \text{b) } \int x \ln(1-x) dx \quad \text{c) } \int \frac{x^3 + x^2 - 2x - 6}{x^2 - 1} dx$$

Oppgave 6.

Eksamen MET1180 (Mai 2016) Oppgave 3abc

Regn ut disse ubestemte integralene:

$$\text{a) } \int \frac{\ln x + 1}{x^2} dx \quad \text{b) } \int x^3 \sqrt{x^2 + 4} dx \quad \text{c) } \int \frac{x^2}{x^2 + 5x + 4} dx$$

Oppgave 7.

Regn ut disse ubestemte integralene:

$$\text{a) } \int 2x^3 e^{-x^2} dx \qquad \text{b) } \int \sqrt{x} e^{\sqrt{x}} dx \qquad \text{c) } \int \frac{\sqrt{x} + 1}{1 - \sqrt{x}} dx$$

Oppgave 8.

Eksamen MET1180 (Mai 2023) Oppgave 2abcd

Regn ut disse integralene:

$$\text{a) } \int_0^1 1 + e^{2x} dx \qquad \text{b) } \int_0^1 15x\sqrt{x+1} dx \qquad \text{c) } \int_0^1 \frac{3}{9-x^2} dx \qquad \text{d) } \int 2x \ln(\sqrt{x}) dx$$

Oppgave 9.

Regn ut det ubestemte integralet:

$$\int_{-1}^1 \frac{e^x}{e^x + 1} dx$$

Oppgaver fra læreboken

Læreboken [E]: Eriksen, *Matematikk for økonomi og finans*

Oppgaveboken [O]: Eriksen, *Matematikk for økonomi og finans - Oppgaver og Løsningsforslag*

Oppgaver: [E] 5.5.1 - 5.5.6, 5.6.1 - 5.6.2

Fullstendig løsning: Se [O] Kap 5.5 - 5.6

Svar på veiledningsoppgaver

Oppgave 1.

$$\begin{array}{ll} \text{a) } -4 \ln |4 - x| + C & \text{b) } \ln |2 + x| - \ln |2 - x| + C \\ \text{c) } -2 \ln |2 - x| - 2 \ln |2 + x| + C & \text{d) } -x + \ln |2 + x| - \ln |2 - x| + C \end{array}$$

Oppgave 2.

$$\begin{array}{lll} \text{a) } \frac{1}{2} \ln \left| \frac{1+x}{1-x} \right| + C & \text{b) } -\ln |1-x^2| + C & \text{c) } -x + \frac{1}{2} \ln \left| \frac{1+x}{1-x} \right| + C \\ \text{d) } -x + \ln \left| \frac{1+x}{1-x} \right| + \ln |1-x^2| + C & \text{e) } \frac{1}{1-x} + C & \text{f) } 2 \ln |1-x| + \frac{2}{1-x} + C \\ \text{g) } x + 2 \ln |1-x| + \frac{1}{1-x} + C & \text{h) } x + C & \end{array}$$

Oppgave 3.

$$\begin{array}{llll} \text{a) } 1/2 & \text{b) } 1/3 & \text{c) } 1/4 & \text{d) } e - 1 \\ \text{f) } 0 & \text{g) } 2/3 & \text{h) } 0 & \text{e) } e - 1/e \\ & & & \text{j) } 2(e - 1/e) \end{array}$$

Oppgave 4.

- a) 1 b) $\ln(2) - 1/2$ c) $2\ln(3) - 3\ln(2)$ d) $1/6$
e) $2/e$ f) 0 g) $\ln(3) - \ln(2)$ h) $2/3$

Oppgave 5.

- a) $-\frac{1}{2}e^{1-x^2} + \mathcal{C}$ b) $\frac{1}{2}x^2 \ln(1-x) - \frac{1}{2}x - \frac{1}{4}x^2 - \frac{1}{2} \ln(1-x) + \mathcal{C}$
c) $\frac{1}{2}x^2 + x - 3\ln|x-1| + 2\ln|x+1| + \mathcal{C}$

Oppgave 6.

- a) $-\frac{1}{x}(\ln x + 2) + \mathcal{C}$ b) $\frac{1}{5}(x^2 + 4)^{5/2} - \frac{4}{3}(x^2 + 4)^{3/2} + \mathcal{C}$
c) $x - \frac{16}{3} \ln|x+4| + \frac{1}{3} \ln|x+1| + \mathcal{C}$

Oppgave 7.

- a) $-x^2 e^{-x^2} - e^{-x^2} + \mathcal{C}$ b) $2xe^{\sqrt{x}} - 4\sqrt{x}e^{\sqrt{x}} + 4e^{\sqrt{x}} + \mathcal{C}$
c) $5 - 4\sqrt{x} - x - 4\ln|1 - \sqrt{x}| + \mathcal{C}$

Oppgave 8.

- a) $\frac{e^2 + 1}{2}$ b) $4\sqrt{2} + 4$ c) $\frac{1}{2} \ln 2$ d) $\frac{1}{2}x^2 \ln x - \frac{1}{4}x^2 + \mathcal{C}$

Oppgave 9.

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