MAT1080: Ekstraoppgaver til kapittel 3

Ubestemte integraler

Oppgave 1. Løs integralene:

a) $\int x \cos x \, dx$

b) $\int xe^{-x} \, dx$

c) $\int x^2 \sin x \, dx$

d) $\int x^2 \ln x \, dx$

e) $\int \sqrt{x} \ln x \, dx$

Oppgave 2. Løs integralene:

a) $\int x \cos x^2 \, dx$

b) $\int x^2 e^{-x^3} \, dx$

c) $\int \frac{\sin(\ln x)}{x} \, dx$

d) $\int e^{\sqrt{x}}, dx$

e) $\int \frac{\sqrt{x}}{\sqrt{x}+1} \, dx$

Fasit

Oppgave 1.

a) $x \sin x + \cos x + C$

b) $-xe^{-x} - e^{-x} + C$

c) $2x \sin x + (2 - x^2) \cos x + C$

d) $\frac{x^3}{3} \ln x - \frac{x^3}{9} + C$

e) $\frac{2x^{3/2}}{3} \ln x - \frac{4x^{3/2}}{9} + C$

Oppgave 2.

a) $\frac{\sin(x^2)}{2} + C$

b) $-\frac{e^{-x^3}}{3} + C$

c) $-\cos(\ln x) + C$

d) $2e^{\sqrt{x}}(\sqrt{x} - 1) + C$

e) $x - 2\sqrt{x} + 2\ln(\sqrt{x} + 1) + C$