

Øvingsoppgaver matte forkurs HIO, vår 2009

Oppgave 1

$$a) \int 2x + \sin x + e^x + \frac{1}{x} dx$$

$$b) \int 3x^{5/7} + \sin(-2x + 3) + e^{x/2} + \frac{1}{3x + 1} dx$$

Oppgave 2

$$a) \int (1 + x^3)^2 dx$$

$$b) \int \left(\frac{1}{\sqrt{x}} - 3\right)^2 dx$$

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

$$d) \int \sin^5 x dx$$

Oppgave 3

$$a) \int x^2(1 + x^3)^{20} dx$$

$$\int e^x \sqrt{e^{x+1} + 2} dx$$

Oppgave 4

$$a) \int \frac{1}{x(2x + 1)} dx$$

$$b) \int \frac{4}{x(x + 1)(x + 2)} dx$$

Oppgave 5

$$a) \int \frac{2x + 1}{(3x + 4)^2} dx$$

$$b) \int \frac{1}{x(-2x + 3)^2} dx$$

Oppgave 6

$$a) \int \ln(x^3) dx$$

$$b) \int (x+1)^7 \ln(e^2(x+1)^2) dx$$

Oppgave 7

$$a) \int e^{-x} \cos(x) dx$$

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

Oppgave 8

$$a) \int \sin^2 x dx$$

$$b) \int \sin^4(3x+1) dx$$

(Hint: $\cos(2x) = \cos^2 x - \sin^2 x$, så

$$\sin^2 x = \frac{1}{2}(1 - \cos(2x)) \quad \text{og} \quad \cos^2 x = \frac{1}{2}(1 + \cos(2x)).$$