Rettevejledning (lektion 1 og 2)

14.2.1 e)

$$\int \frac{4x}{x^2+1}\,dx = 2\int \frac{2x}{x^2+1}\,dx = 2\int \frac{1}{u}\,du = 2\ln|u|+C$$

$$\left(\begin{matrix} u = x^2+1 \\ du = 2x\,dx \end{matrix}\right)$$

$$= 2\ln|x^2+1|+C$$

14.2.4 b)

$$\int x \ln x\,dx = \left[\tfrac{1}{2}x^2 \ln x\right] - \int \tfrac{1}{2}x^2 \tfrac{1}{x}\,dx = \tfrac{1}{2}x^2\ln x - \tfrac{1}{4}x^2 + C$$

$(f(x)\,G(x))$ $(F(x)\,G(x))$ $(F(x)g(x))$

$$= \tfrac{1}{2}x^2\left(\ln x - \tfrac{1}{2}\right)+C$$

14.3.2 d)

$$\int_e^6 \left(\frac{1}{x} + \frac{1}{1+x}\right)dx = \int_e^6 \frac{1}{x}\,dx + \int_e^6 \frac{1}{1+x}\,dx =$$

$$\left[\ln x\right]_e^6 + \left[\ln(1+x)\right]_e^6 = \ln 6 - \ln e + \ln 7 - \ln(1+e)$$

$$= \ln 42 - 1 - \ln(1+e)$$

$$= 1.42 \quad \text{(afrundet til 2 dec)}$$