

2. Integroit ilman laskinohjelmistoja (6 p.)

a) $\frac{1}{\sqrt{2x+1}}$

b) $6e^{4x+2}$

c) $x \cos(x^2 - 1)$

a)

$$\begin{aligned}\int \frac{1}{\sqrt{2x+1}} dx &= \int (2x+1)^{-\frac{1}{2}} dx \\ &= \frac{1}{2} \int 2 \cdot (2x+1)^{-\frac{1}{2}} dx && (1 \text{ p.}) \\ &= \frac{1}{2} \cdot \frac{1}{-\frac{1}{2}+1} \cdot (2x+1)^{-\frac{1}{2}+1} + C \\ &= (2x+1)^{\frac{1}{2}} + C \\ &= \underline{\underline{\sqrt{2x+1} + C}} && (1 \text{ p.})\end{aligned}$$

b)

$$\begin{aligned}\int 6e^{4x+2} dx &= 6 \cdot \frac{1}{4} \int 4 \cdot e^{4x+2} dx = \frac{6}{4} e^{4x+2} + C = \frac{3}{2} e^{4x+2} + C \\ &(1 \text{ p.}) && (1 \text{ p.})\end{aligned}$$

c)

$$\begin{aligned}\int x \cos(x^2 - 1) dx &= \frac{1}{2} \int 2x \cos(x^2 - 1) dx = \frac{1}{2} \sin(x^2 - 1) + C \\ &(1 \text{ p.}) && (1 \text{ p.})\end{aligned}$$