

Kokeesta

A-osa (4 teht. 3 vast.)

- monuvalinta integraalipunktiosta
- pinta-ala
- sereennys \rightarrow integrointi
- pistorahdyskappale

B-osa (5 teht, 3 vast.)

- pinta-alaan sovellus
- pistorahdyskappale x ja y
- iteseisarvopunktion integrointi
- $f'' \rightarrow f$
- $A(x) \rightarrow V$

$$\int \frac{2x^3}{x^4 + 1} dx = \left(\frac{1}{2} \right) \int \frac{2x^3}{x^4 + 1} dx = \frac{1}{2} \ln|x^4 + 1| + C$$

$D(x^4 + 1) = 4x^3$

$$\int (x - 4)(3x + 2) dx = \int (3x^2 - 10x - 8) dx = \underline{\underline{x^3 - 5x^2 - 8x + C}}$$

$3x^2 + 2x - 12x - 8$

$$\int \frac{4}{x\sqrt{x}} dx = \int \frac{4}{x^{\frac{3}{2}}} dx = \int 4x^{-\frac{3}{2}} dx = -2 \cdot 4 x^{-\frac{1}{2}} + C = -\frac{8}{x^{\frac{1}{2}}} + C = \underline{\underline{-\frac{8}{\sqrt{x}} + C}}$$

$x^1 \cdot x^{\frac{1}{2}}$

$$\int \frac{4x^4 - 3x^2 + 8x}{2x} dx, \text{ kun } x > 0 = \int \left(\frac{4x^4}{2x} - \frac{3x^2}{2x} + \frac{8x}{2x} \right) dx = \int \left(2x^3 - \frac{3}{2}x + 4 \right) dx = \underline{\underline{\frac{1}{2}x^4 - \frac{3}{4}x^2 + 4x + C}}$$

$$\int 2xe^{2x^2} dx = \left(\frac{1}{2} \right) \int 2 \cdot 2x e^{2x^2} dx = \underline{\underline{\frac{1}{2} e^{2x^2} + C}}$$

$D 2x^2 = 4x$

$$\int_0^{\pi} \sin 3x dx = \left(\frac{1}{3} \right) \int_0^{\pi} 3 \sin(3x) dx = \frac{1}{3} \left| -\cos(3x) \right|_0^{\pi} = \frac{1}{3} \left(\overbrace{\cos(3\pi)}^{-1} - \overbrace{\cos(0)}^1 \right) = \underline{\underline{\frac{2}{3}}}$$

$D 3x = 3$