

$$D \quad 4x^3 + 7x + 2 = \dots$$

$$\int 2x \, dx = x^2 + C$$

$C = \text{integ. vakio}$

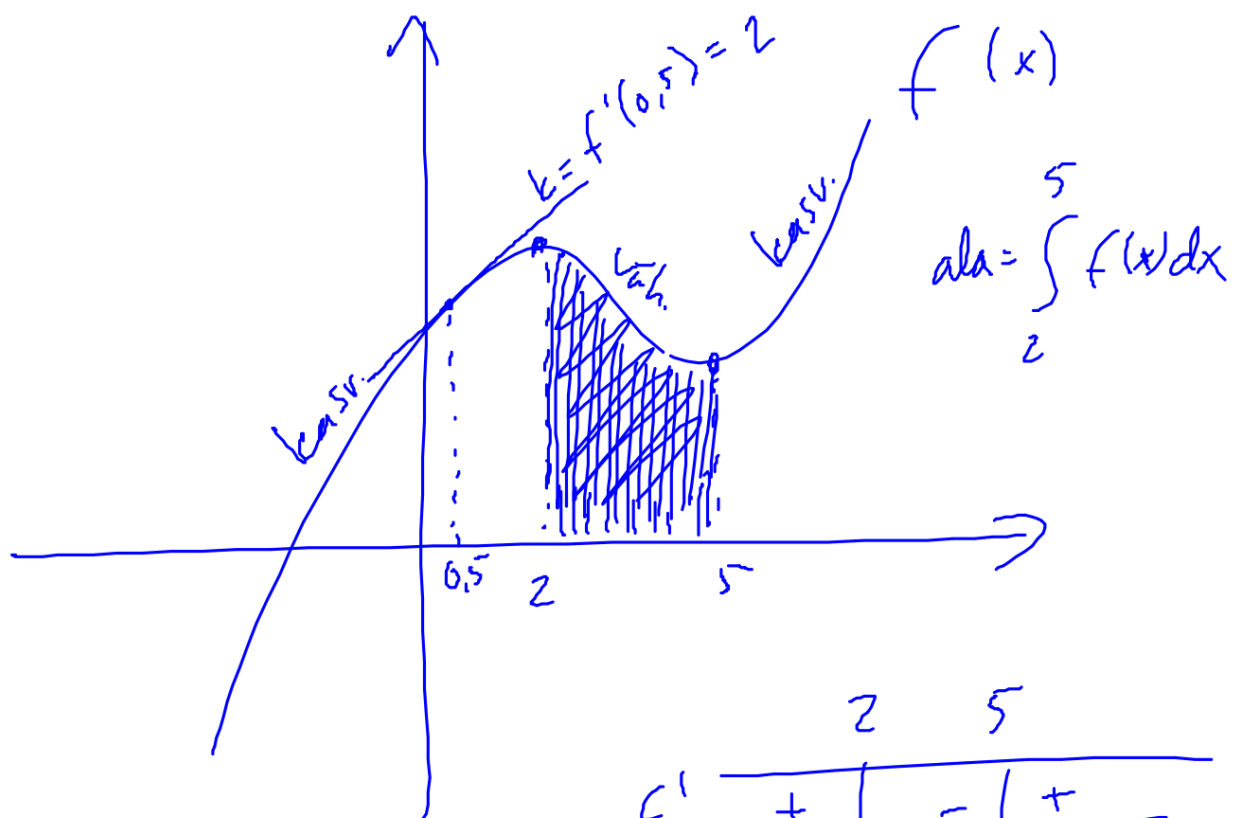
$$D \underbrace{(2x^2+3x)}^7 = 7(2x^2+3x)^6 \cdot (4x+3)$$

$$s(x) = 2x^2 + 3x, \quad s'(x) = 4x + 3$$

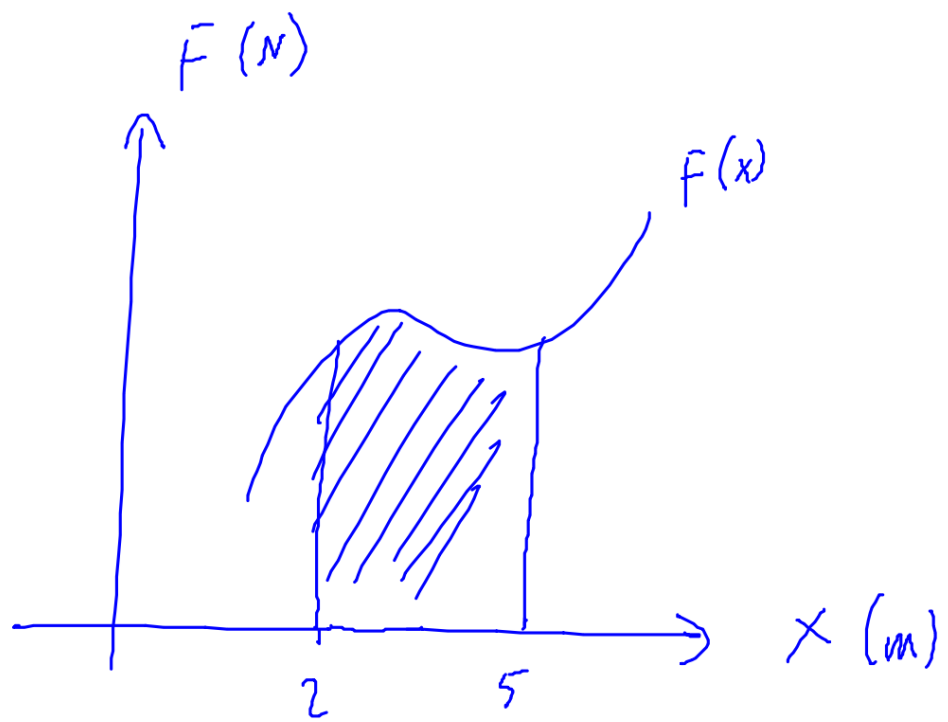
$$u(x) = x^7, \quad u'(x) = 7x^6$$

$$D \sin x = \cos x$$

$$D \sin(x^2) = \cos(x^2) \cdot 2x$$



	2 5		
f'	+	-	+
f	↗	↘	↗



$$W = \int F(x) dx$$

Int. funktion määrit.

$F(x)$ on $f(x):n$ int. funktio

$$\Leftrightarrow F'(x) = f(x)$$

Oletko x^2 $2x:n$ integ. funktio?
on koska $Dx^2 = 2x$

202. $F(x) = (5-x)^2 = x^2 - 10x + 25$

$$f(x) = 2x - 10$$

Vi ser: $\int f(x) dx = F(x)$

Test: $F'(x) = 2(5-x) \cdot (-1)$
 $= 2x - 10 = f(x) \quad \square$

$$\left(\int 2x - 10 \, dx = x^2 - 10x + C \right)$$

Sammenheng

- $F(x)$ on $f(x)$:n integ. funktio

$$\Leftrightarrow F'(x) = f(x).$$

- $f(x)$:n integ. funktiot ovat

$$F(x) + C$$

Esim. $2x$:n kaikki integ. funktiot
ovat $x^2 + C$

211. a) $\int (4x - 2t) dx = 2x^2 - 2tx + C$

b) $\int (4x - 2t) dt = 4xt - t^2 + C$

c) $\int (4x - 2t) da = (4x - 2t)a + C$

s. 11

$$D \sin x = \cos x$$

$$D \cos x = -\sin x$$

$$D \ln x = \frac{1}{x}, \quad x > 0$$

$$D e^x = e^x \quad Dfg = f'g + fg'$$