3.1:34 Anta f og g har inverse f^{-1} og g^{-1}.
Vis at funksjonen $f \circ g$ har invers

$$(f \circ g)^{-1} = g^{-1} \circ f^{-1}$$

Løsning: Viser at $f \circ g$ er 1-1:

Anta at $(f \circ g)(x_1) = (f \circ g)(x_2)$ $\quad x_1, x_2 \in D(f \circ g)$

$\Rightarrow \quad f(g(x_1)) = f(g(x_2))$

$\Rightarrow \quad g(x_1) = g(x_2)$ fordi f er 1-1

$\Rightarrow \quad x_1 = x_2$ fordi g er 1-1

Finner inversen:

$$y = (f \circ g)^{-1}(x)$$

$$\Rightarrow \quad x = (f \circ g)(y) = f(g(y))$$

$$\Rightarrow \quad f^{-1}(x) = f^{-1}(f(g(y))) = g(y)$$

$$\Rightarrow \quad g^{-1}(f^{-1}(x)) = g^{-1}(g(y)) = y$$

$$\Rightarrow \quad (f \circ g)^{-1}(x) = y$$

$$= g^{-1}(f^{-1}(x))$$

$$= (g^{-1} \circ f^{-1})(x) \qquad \text{II}$$