Exercise 80

If $f(1) = 4$, find $f^{-1}(4)$.

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Solution

Assume that f is a one-to-one function (meaning that it has an inverse) and that

$$f(1) = 4.$$

Apply f^{-1} to both sides.

$$f^{-1}(f(1)) = f^{-1}(4)$$

The function and its inverse cancel out on the left side, leaving 5.

$$1 = f^{-1}(4)$$

Therefore,

$$f^{-1}(4) = 1.$$