Exercise 34

For the following exercises, evaluate or solve, assuming that the function f is one-to-one.

If $f(3) = 2$, find $f^{-1}(2)$.

Solution

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

$$f(3) = 2.$$

Apply f^{-1} to both sides.

$$f^{-1}(f(3)) = f^{-1}(2)$$

The function and its inverse cancel on the left side, leaving 3.

$$3 = f^{-1}(2)$$

Therefore,

$$f^{-1}(2) = 3.$$