Exercise 33

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

If $f(6) = 7$, find $f^{-1}(7)$.

Solution

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

$$f(6) = 7.$$

Apply f^{-1} to both sides.

$$f^{-1}(f(6)) = f^{-1}(7)$$

The function and its inverse cancel on the left side, leaving 6.

$$6 = f^{-1}(7)$$

Therefore,

$$f^{-1}(7) = 6.$$