

1. Determine if $f(x) = 2 + \sin(x)$ is one-to-one. If so, find the inverse. If not, what conditions can you put on this function to make it one-to-one?

2. Is the function $f(x) = \sqrt[3]{x}$ one-to-one? Why or why not?

3. Let $f(x) = 5 - 4x$. Find $f^{-1}(x)$.

$$f^{-1}(x) = 5/4 - x/4$$

4. Let $f(x) = 1 + \sqrt{2 + 3x}$. Find $f^{-1}(x)$.

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

5. Assume that f is a one-to-one function.

(a) If $f(6) = 17$, what is $f^{-1}(17)$?

$$f^{-1}(17) = 6$$

(b) If $f^{-1}(3) = 2$, what is $f(2)$?

$$f(2) = 3$$

6. If $h(x) = x + \sqrt{x}$, find $h^{-1}(6)$.

$$h^{-1}(6) = 4.$$

7. If $f(x) = x^5 + x^3 + x$, find $f^{-1}(3)$ and $f(f^{-1}(2))$.

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

8. Find $(f^{-1})'(a)$ for:

(a) $f(x) = 3x^3 + 4x^2 + 6x + 5$, $a = 5$

$$(f^{-1})'(5) = 1/6$$

(b) $f(x) = x^3 + 3\sin(x) + 2\cos(x)$, $a = 2$

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