Outcome 1 – Inverse Functions

Examples

Example... $f(f^{-1}(x)) = f^{-1}(f(x)) = x$

If you sub a number into a function and your answer into the inverse function you will end up with the number that you started with

The inverse function for $f(x)$ is... $f^{-1}(x)$.

A function is given by $f(x) = 7x + 3$.

Find the inverse function $f^{-1}(x)$.

$f(x) = 7x + 3$

$y = 7x + 3$

$7x + 3 = y$

$7x = y - 3$

$x = \frac{y - 3}{7}$

1. Replace $f(x)$ with y
2. Change the subject of the formula to x.
3. Replace x with $f^{-1}(x)$ and y with x.

$f^{-1}(x) = \frac{x - 3}{7}$

Questions

For each of the following, find the inverse function...

1. $f(x) = x + 2$
2. $g(x) = x - 10$
3. $h(x) = 6x + 1$
4. $k(x) = 4x - 15$
5. $g(x) = \frac{1}{9}x - 4$
6. $h(x) = \frac{x}{7} + 3$
7. $f(x) = \frac{x - 8}{19}$
8. $k(x) = \frac{x + 5}{2}$
9. $g(x) = 8(x + 6)$
10. $h(x) = 3(x - 7)$

Answers

1. $f^{-1}(x) = x - 2$
2. $g^{-1}(x) = x + 10$
3. $h^{-1}(x) = (x - 1)/6$
4. $k^{-1}(x) = (x + 15)/4$
5. $g^{-1}(x) = 9(x + 4)$
6. $h^{-1}(x) = 7(x - 3)$
7. $f^{-1}(x) = 19x + 8$
8. $k^{-1}(x) = 2x - 5$
9. $g^{-1}(x) = x/8 - 6$
10. $h^{-1}(x) = x/3 + 7$