



eduresourceza.com

Functions

Introducing Inverse Functions

We explore a new topic related to functions: inverse functions.

Lesson Outcomes

By the end of this lesson, you should be able to:

- Describe an inverse function
- List a few examples of inverses of functions

Curriculum Links

LO 2: Functions and Algebra

- 12.2.7 (a) Demonstrate the ability to work with various types of functions and relations including inverses
- 12.2.2 (a) Investigate and generate graphs of the inverse relations of functions
- 12.2.3 Identify characteristics and use applicable characteristics to sketch graphs of the inverses of the functions

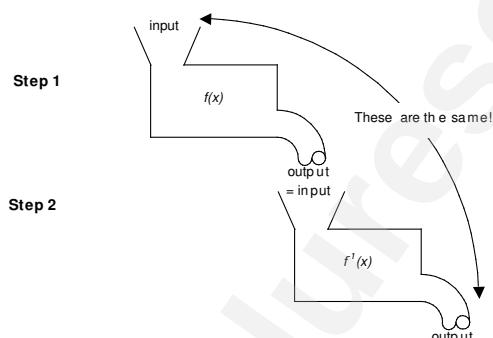
Lesson Notes

In previous lessons we have examined and used functions. The inverse of a function undoes the action of a function.

Look at the diagram below to check that the process:

Step 1: The input value of the function $f(x)$ produces an output.

Step 2: The inverse function will take that output value as its input and produce an output which is the original input value.

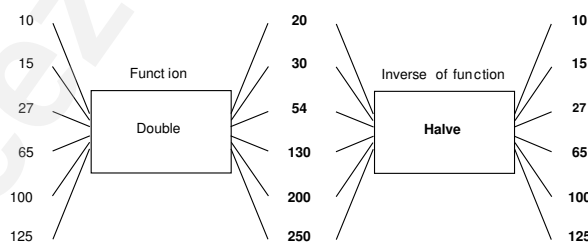


The inverse function is denoted as follows: $f^{-1}(x)$

The notation often causes confusion. Please note that x^{-1} is defined as

$f^{-1}(x)$ does not mean the same. When we see this notation we call it the inverse of f and not f to the minus 1

A simple flow diagram that uses different values is also used to show how the inverse of a function undoes what the function does. In this example the original function doubles the input values and the inverse of the function undoes this by halving all its inputs.



When looking at the function that squares the inputs we find that the inverse is not a function. We investigate when the inverse of a function is a function itself and find out what to do when the inverse is not a function.

Task

Determine what the inverse function must do if the function subtracts 1 from the input value and then divides the answer by 3.