

Aim: How do we find the inverse of a function algebraically?**I. Do Now:**

1. Given $f(x) = 3x - 5$ and $g(x) = \frac{x+5}{3}$,

find:

(a) $f(g(1))$

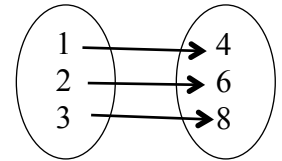
(b) $g(f(1))$

(c) $f(g(x))$

or, $(f \circ g)(x)$

(d) $g(f(x))$

or, $(g \circ f)(x)$

2. Given $f(x)$:

(a) Write the relation displayed above as a set of ordered pairs:

$$f(x) = \{ \quad \quad \quad \}$$

(b) Does the relation represent a function? Why or why not?

II. A function f can be represented by a set of ordered pairs. By interchanging the first and second coordinates of each pair, we can form the *inverse function* of f , denoted by f^{-1} , read “ f inverse,” *IF IT EXISTS*.

Example, for #2: $f^{-1}(x) = \{ \quad \quad \quad \}$

Notes:

III. Verifying Inverse FunctionsWe can show that functions are inverses of each other by using *composition*.

3. Use composition to verify that the following functions are inverses of each other.

$$f(x) = 2x^3 - 1$$

$$g(x) = \sqrt[3]{\frac{x+1}{2}}$$

IV. Algebraic Method to Find Inverses

4. Find the inverse:

(a) $f(x) = 8x - 2$

(b) $g(x) = \frac{x^3 - 4}{2}$

(c) $h(x) = x^2$

V. Procedure to find the inverse of a function:

HW21

Read pages 60 – 62.

p. 67: 7, 9, 13, 19, 20, 26a

p. 56: 14, 49, 55a, 56a, 71