# Algebra: Inverse of a Function

*Practice Worksheet • numberbender.com*

Name: _____ Date: _____ Score: ____ / 10

## DIRECTIONS

*Find the inverse function $f^{-1}(x)$ for each. Replace f(x) with y, swap x and y, then solve for y.*

**1.** Find $f^{-1}(x)$:

$$f(x) = 3x + 6$$

Answer: _____

**2.** Find $f^{-1}(x)$:

$$f(x) = 2x - 7$$

Answer: _____

**3.** Find $f^{-1}(x)$:

$$f(x) = -2x + 5$$

Answer: _____

**4.** Find $f^{-1}(x)$:

$$f(x) = 4x - 3$$

Answer: _____

**5.** Find $f^{-1}(x)$:

$$f(x) = x + 8$$

Answer: _____

**6.** Find $f^{-1}(x)$:

$$f(x) = -x + 4$$

Answer: _____

**7.** Find $f^{-1}(x)$:

$$f(x) = \frac{x - 2}{5}$$

Answer: _____

**8.** Find $f^{-1}(x)$:

$$f(x) = \frac{x + 1}{3}$$

Answer: _____

**9.** Find $f^{-1}(x)$:

$$f(x) = x^3 + 1$$

Answer: _____

**10.** If f(3) = 7, find:

$$f^{-1}(7) = \ ?$$

Answer: _____

# Answer Key & Solutions

*Algebra: Inverse of a Function • Numberbender*

## TEACHER NOTES

*Items 1–6: linear functions — swap x and y then isolate. Items 7–8: fractional linear — multiply to clear denominator. Item 9: cube root reverses a cubic. Item 10: conceptual — if f(a) = b then $f^{-1}(b) = a$.*

1. Find $f^{-1}(x)$: **f(x) = 3x + 6**
**Answer: $f^{-1}(x) = (x - 6) / 3$**
*$y = 3x+6 \rightarrow x = 3y+6 \rightarrow y = (x-6)/3$.*

2. Find $f^{-1}(x)$: **f(x) = 2x − 7**
**Answer: $f^{-1}(x) = (x + 7) / 2$**
*$x = 2y-7 \rightarrow 2y = x+7 \rightarrow y = (x+7)/2$.*

3. Find $f^{-1}(x)$: **f(x) = −2x + 5**
**Answer: $f^{-1}(x) = (5 - x) / 2$**
*$x = -2y+5 \rightarrow 2y = 5-x \rightarrow y = (5-x)/2$.*

4. Find $f^{-1}(x)$: **f(x) = 4x − 3**
**Answer: $f^{-1}(x) = (x + 3) / 4$**
*$x = 4y-3 \rightarrow 4y = x+3 \rightarrow y = (x+3)/4$.*

5. Find $f^{-1}(x)$: **f(x) = x + 8**
**Answer: $f^{-1}(x) = x - 8$**
*$x = y+8 \rightarrow y = x-8$.*

6. Find $f^{-1}(x)$: **f(x) = −x + 4**
**Answer: $f^{-1}(x) = 4 - x$**
*$x = -y+4 \rightarrow y = 4-x$. This function is its own inverse!*

7. Find $f^{-1}(x)$: **f(x) = (x − 2) / 5**
**Answer: $f^{-1}(x) = 5x + 2$**
*$x = (y-2)/5 \rightarrow 5x = y-2 \rightarrow y = 5x+2$.*

8. Find $f^{-1}(x)$: **f(x) = (x + 1) / 3**
**Answer: $f^{-1}(x) = 3x - 1$**
*$x = (y+1)/3 \rightarrow 3x = y+1 \rightarrow y = 3x-1$.*

9. Find $f^{-1}(x)$: **$f(x) = x^3 + 1$**
**Answer: $f^{-1}(x) = \sqrt[3]{(x - 1)}$**
*$x = y^3+1 \rightarrow y^3 = x-1 \rightarrow y = \sqrt[3]{(x-1)}$.*

10. If f(3) = 7, find: **$f^{-1}(7) = ?$**
**Answer: $f^{-1}(7) = 3$**
*If $f(a) = b$, then $f^{-1}(b) = a$. Since $f(3) = 7$, $f^{-1}(7) = 3$.*