



Practice B

Functions and Their Inverses

Find the inverse of each function. Determine whether the inverse is a function and state its domain and range.

1. $k(x) = 10x + 5$

2. $d(x) = 6 - 2x$

3. $f(x) = (x - 5)^2$

4. $g(x) = \frac{4 - x}{2}$

5. $h(x) = \sqrt{x^2 - 9}$

6. $b(x) = 2\log x$

Determine by composition whether each pair of functions are inverses.

7. $q(x) = \sqrt{x} - 4$
and $r(x) = x^2 + 4$ for $x \geq 0$

8. $s(x) = \frac{2}{x-2}$ and $t(x) = \frac{x+2}{-2}$

9. $u(x) = \frac{x^2}{4} - 1$ for $x \geq -1$
and $v(x) = \pm 2\sqrt{x+1}$

10. $A(x) = \log(x-1)^4$
and $B(x) = 1 + \log^{-1}\left(\frac{x}{4}\right)$

Solve.

11. So far, Rhonda has saved \$3000 for her college expenses. She plans to save \$30 each month. Her college fund can be represented by the function $f(x) = 30x + 3000$.

a. Find the inverse of $f(x)$.

b. What does the inverse represent?

c. When will the fund reach \$3990?

d. How long will it take her to reach her goal of \$4800?

TEKS 2A.4.C



LESSON
9-5

Practice B

Functions and Their Inverses

Find the inverse of each function. Determine whether the inverse is a function and state its domain and range.

1. $k(x) = 10x + 5$

$$k^{-1}(x) = \frac{x - 5}{10}; \text{ function}$$

domain: $(-\infty, +\infty)$

range: $(-\infty, +\infty)$

2. $d(x) = 6 - 2x$

$$d^{-1}(x) = -\frac{x}{2} + 3; \text{ function}$$

domain: $(-\infty, +\infty)$

range: $(-\infty, +\infty)$

3. $f(x) = (x - 5)^2$

$$y = 5 \pm \sqrt{x}; \text{ not a function}$$

domain: $(-\infty, +\infty)$

range: $[0, +\infty)$

4. $g(x) = \frac{4 - x}{2}$

$$g^{-1}(x) = -2x + 4; \text{ function}$$

domain: $(-\infty, +\infty)$

range: $(-\infty, +\infty)$

5. $h(x) = \sqrt{x^2 - 9}$

$$h^{-1}(x) = \pm \sqrt{x^2 + 9}; \text{ not a function}$$

domain: $[0, +\infty)$

range: $(-\infty, -3]$ and $[3, +\infty)$

6. $b(x) = 2 \log x$

$$b^{-1}(x) = \log^{-1} \frac{x}{2} \text{ or } b^{-1}(x) =$$

$10^{\frac{x}{2}}; \text{ function; domain: } (-\infty, +\infty)$

range: $[0, +\infty)$

Determine by composition whether each pair of functions are inverses.

7. $q(x) = \sqrt{x} - 4$

and $r(x) = x^2 + 4$ for $x \geq 0$

No

8. $s(x) = \frac{2}{x-2}$ and $t(x) = \frac{x+2}{-2}$

No

9. $u(x) = \frac{x^2}{4} - 1$ for $x \geq -1$

and $v(x) = \pm 2\sqrt{x+1}$

Yes

10. $A(x) = \log(x-1)^4$

and $B(x) = 1 + \log^{-1}\left(\frac{x}{4}\right)$

Yes

Solve.

11. So far, Rhonda has saved \$3000 for her college expenses. She plans to save \$30 each month. Her college fund can be represented by the function

$$f(x) = 30x + 3000.$$

- Find the inverse of $f(x)$.
- What does the inverse represent?
- When will the fund reach \$3990?
- How long will it take her to reach her goal of \$4800?

$$f^{-1}(x) = \frac{1}{30}x - 100$$

Number of months she has saved

33 months

5 years