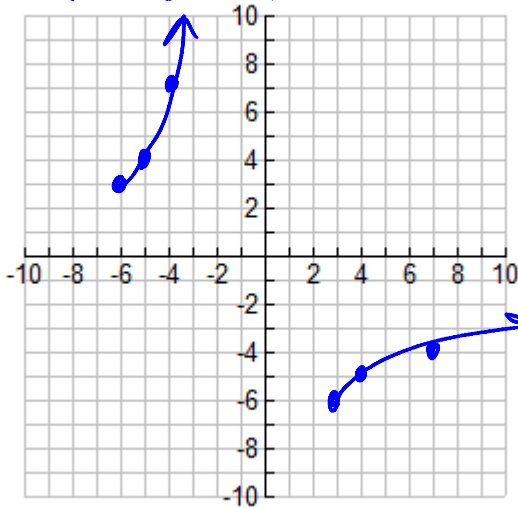


Algebra 2 Trig H

3.6 day 2 practice

1. a. Graph  $f(x)$  and  $f^{-1}(x)$  and state the domain and range of each.

$$f(x) = \sqrt{x-3} - 6$$



Domain of  $f(x)$ :  $[3, \infty)$

Range of  $f(x)$ :  $[-6, \infty)$

Domain of  $f^{-1}(x)$ :  $[-6, \infty)$

Range of  $f^{-1}(x)$ :  $[3, \infty)$

- b. Find  $f^{-1}(x)$  algebraically.

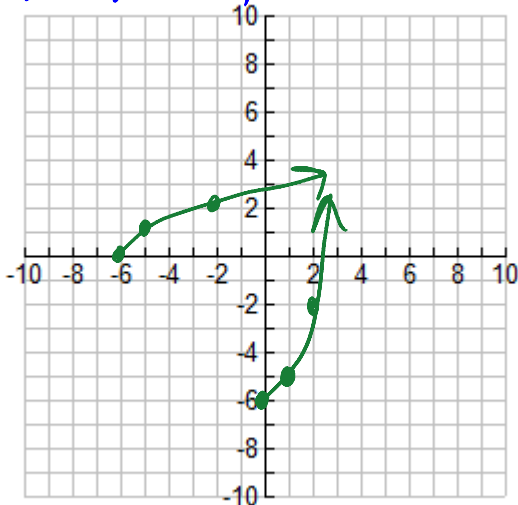
$$x = \sqrt{y-3} - 6$$

$$(x+6)^2 = y-3$$

$$f^{-1}(x) = (x+6)^2 + 3, x \geq -6$$

2. a. Graph  $f(x)$  and  $f^{-1}(x)$  and state the domain and range of each.

$$f(x) = x^2 - 6, x \geq 0$$



Domain of  $f(x)$ :  $[0, \infty)$

Range of  $f(x)$ :  $[-6, \infty)$

Domain of  $f^{-1}(x)$ :  $[-6, \infty)$

Range of  $f^{-1}(x)$ :  $[0, \infty)$

- b. Find  $f^{-1}(x)$  algebraically.

$$x = y^2 - 6$$

$$x+6 = y^2$$

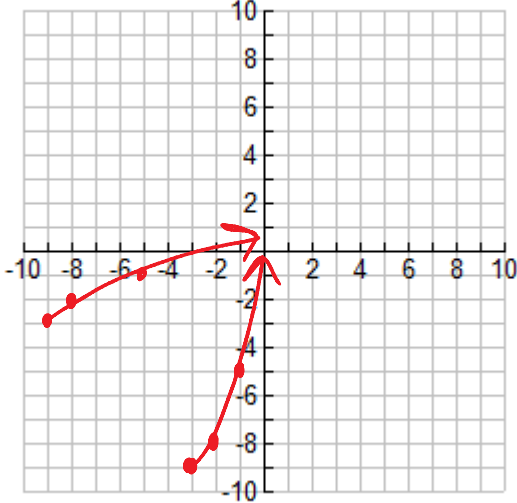
$$y = \sqrt{x+6}$$

$$f^{-1}(x) = \sqrt{x+6}, x \geq -6$$

(only + case)

3. a. Graph  $f(x)$  and  $f^{-1}(x)$  and state the domain and range of each.

$$f(x) = x^2 + 6x, x \geq -3 \rightarrow (x+3)^2 - 9$$



Domain of  $f(x)$ :  $[-3, \infty)$

Range of  $f(x)$ :  $[-9, \infty)$

Domain of  $f^{-1}(x)$ :  $[-9, \infty)$

Range of  $f^{-1}(x)$ :  $[-3, \infty)$

b. Find  $f^{-1}(x)$  algebraically.

$$x = (y+3)^2 - 9$$

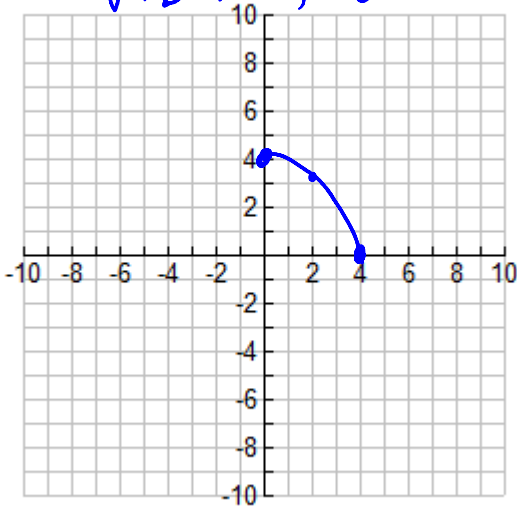
$$x+9 = (y+3)^2$$

$$f^{-1}(x) = \sqrt{x+9} - 3, x \geq -9$$

only  $\oplus$  case

4. a. Graph  $f(x)$  and  $f^{-1}(x)$  and state the domain and range of each.

$$f(x) = \sqrt{16-x^2}, 0 \leq x \leq 4$$



Domain of  $f(x)$ :  $[0, 4]$

Range of  $f(x)$ :  $[0, 4]$

Domain of  $f^{-1}(x)$ :  $[0, 4]$

Range of  $f^{-1}(x)$ :  $[0, 4]$

b. Find  $f^{-1}(x)$  algebraically.

$$x = \sqrt{16-y^2}$$

$$x^2 = 16-y^2$$

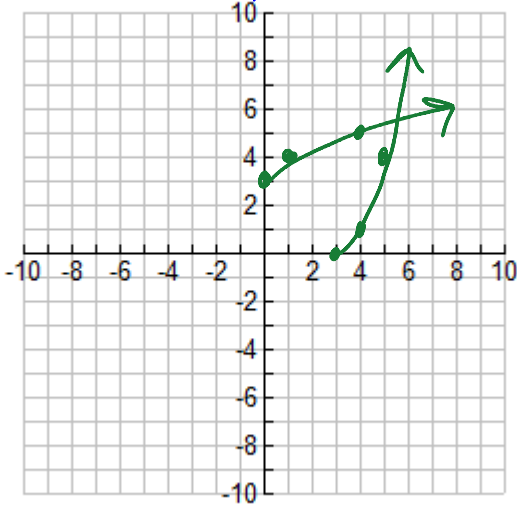
$$x^2-16 = -y^2$$

$$f^{-1}(x) = \sqrt{16-x^2}, 0 \leq x \leq 4$$

only  $\oplus$  case

5. a. Graph  $f(x)$  and  $f^{-1}(x)$  and state the domain and range of each.

$$f(x) = (3-x)^2, x \geq 3 \rightarrow (-x+3)^2$$



Domain of  $f(x)$ :  $[3, \infty)$

Range of  $f(x)$ :  $[0, \infty)$

Domain of  $f^{-1}(x)$ :  $[0, \infty)$

Range of  $f^{-1}(x)$ :  $[3, \infty)$

- b. Find  $f^{-1}(x)$  algebraically.

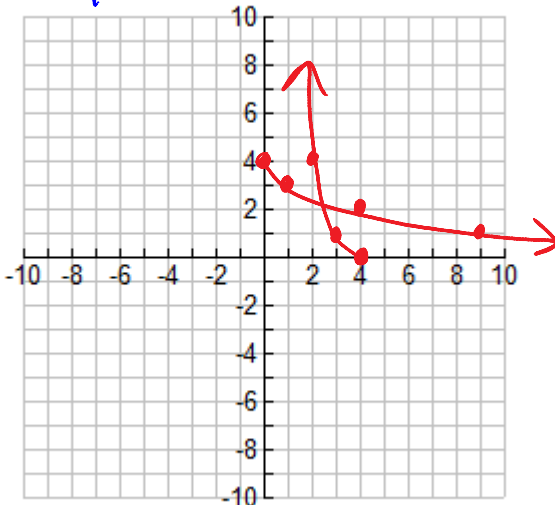
$$\begin{aligned} x &= (3-y)^2 \\ \pm\sqrt{x} &= 3-y \\ y &= \mp\sqrt{x} + 3 \end{aligned}$$

$$f^{-1}(x) = \sqrt{x} + 3, x \geq 0$$

use  $\oplus$  case

6. a. Graph  $f(x)$  and  $f^{-1}(x)$  and state the domain and range of each.

$$f(x) = 4 - \sqrt{x} \rightarrow -\sqrt{x} + 4$$



Domain of  $f(x)$ :  $[0, \infty)$

Range of  $f(x)$ :  $(-\infty, 4]$

Domain of  $f^{-1}(x)$ :  $(-\infty, 4]$

Range of  $f^{-1}(x)$ :  $[0, \infty)$

- b. Find  $f^{-1}(x)$  algebraically.

$$\begin{aligned} x &= 4 - \sqrt{y} \\ x-4 &= -\sqrt{y} \\ (x-4)^2 &= y \end{aligned}$$

$$f^{-1}(x) = (x-4)^2, x \leq 4$$