

Unit 5 Radical Functions

Review

Name: Key

Date: _____ Period: _____

Lesson 1: Graphing Radical Functions

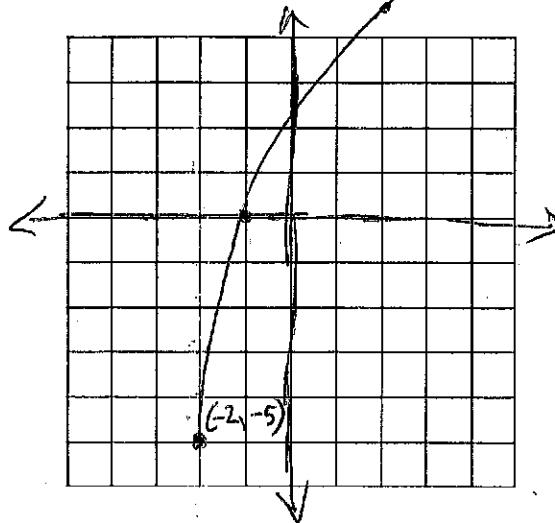
Graph each function. Identify the end/turning point. State the domain and range.

1. $y = 5\sqrt{x+2} - 5$

Point: (-2, -5)

Domain: $[-2, \infty)$

Range: $[-5, \infty)$

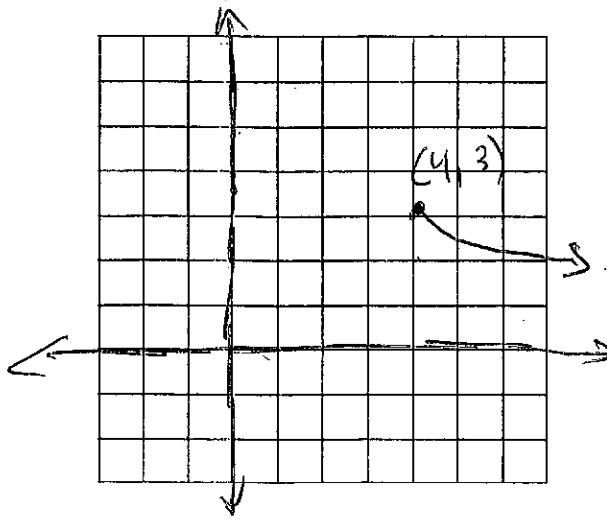


3. $y = -\frac{1}{2}\sqrt{x-4} + 3$

Point: (4, 3)

Domain: $[4, \infty)$

Range: $(-\infty, 3]$

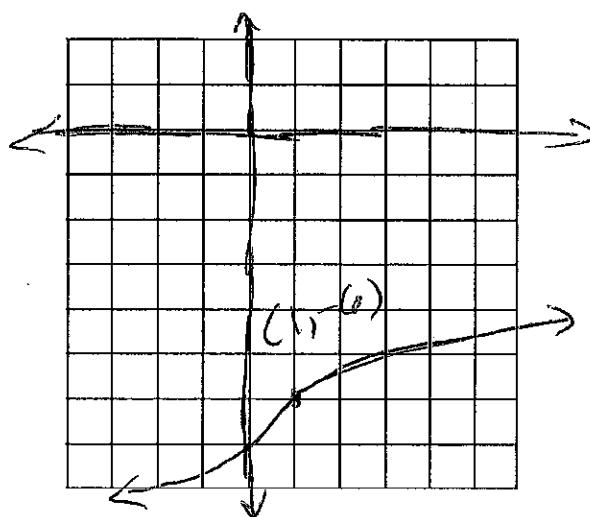


2. $y = \frac{1}{3}\sqrt[3]{x-1} - 6$

Point: (1, -6)

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

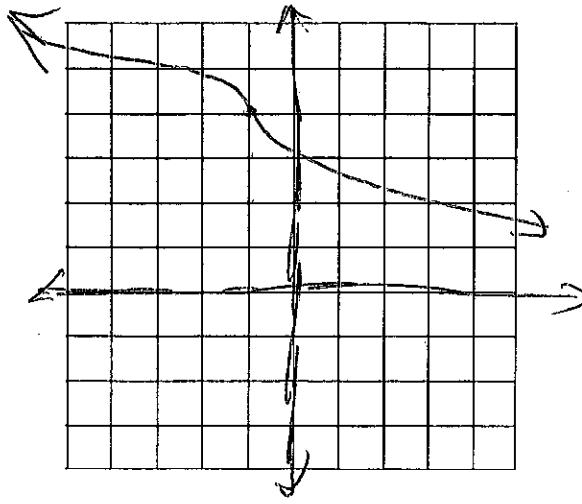


4. $y = -2\sqrt[3]{x+1} + 4$

Point: (-1, 4)

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$



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5. Create an example of a function that would have a domain of $[2, \infty)$. Explain why the domain is all real numbers greater than or equal to 2.

$$f(x) = \sqrt{x-2}$$

There are no values that are less than 2 that would be an answer. Any # less than 2 will result in UND.

6. Create an example of a function that would have a domain of $(-\infty, \infty)$. Explain why the domain is all real numbers.

$$f(x) = x^2$$

There are no #'s that would result in UND.

7. Given the function $f(x) = a\sqrt{x-h} + k$ describe the effects on the parent function $f(x) = \sqrt{x}$ as each value a, h , and k change. How does that change the domain and range?

$$f(x) = 2\sqrt{x-4} + 5$$

- Doubled the height
- Right 4
- Up 5

Domain moved from $[0, \infty)$ to $[4, \infty)$

Range moved from $[0, \infty)$ to $[5, \infty)$

8. Given the function $f(x) = a\sqrt[3]{x-h} + k$ describe the effects on the parent function $f(x) = \sqrt[3]{x}$ as each value a, h , and k change. How does that change the domain and range?

$$f(x) = 2\sqrt[3]{x-4} + 5$$

- Doubled in height
Moved right 4
Up 5

Domain & range did not change.

They are still $(-\infty, \infty)$

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Lesson 2: Inverse Functions

9. Given the function $f(x) = 4x - 12$

Find the inverse function $f^{-1}(x)$:

$$x = 4y - 12$$

$$+12 \quad +12$$

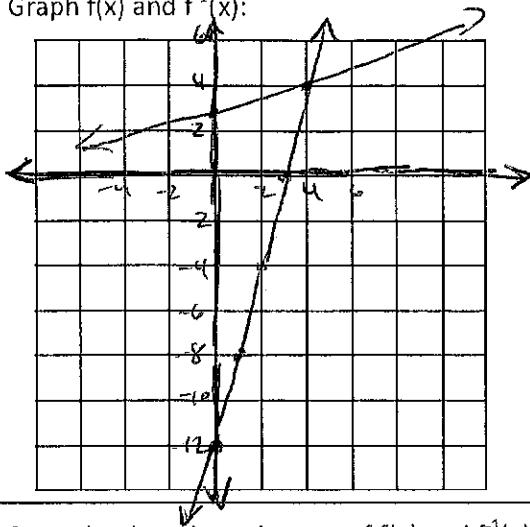
$$\frac{x+12}{4} = \frac{4y}{4}$$

$$\boxed{y = \frac{x+12}{4}}$$

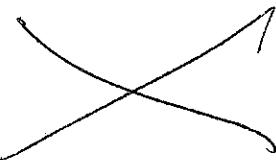
or

$$y = \frac{x}{4} + 3$$

Graph $f(x)$ and $f^{-1}(x)$:



Verify that $f(x)$ and $f^{-1}(x)$ are inverses using function composition.



State the domain and range of $f(x)$ and $f^{-1}(x)$

$$f(x)$$

$$D: (-\infty, \infty)$$

$$R: (-\infty, \infty)$$

$$f^{-1}(x)$$

$$D: (-\infty, \infty)$$

$$R: (-\infty, \infty)$$

10. Given the function $f(x) = x^2 - 3$

Find the inverse function $f^{-1}(x)$:

$$x = y^2 - 3$$

$$+3 \quad +3$$

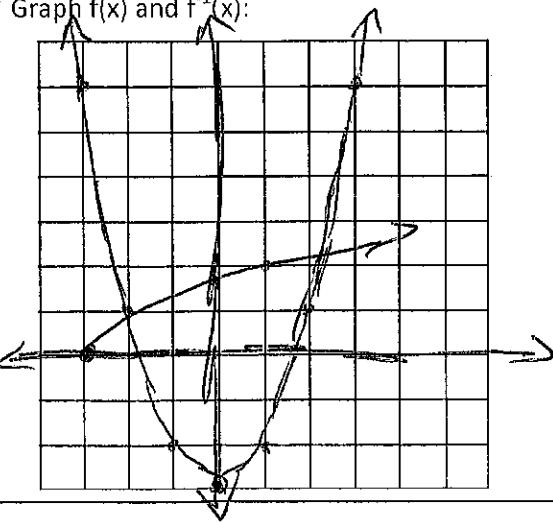
$$\sqrt{x+3} = \sqrt{y^2}$$

$$Y = \sqrt{x+3}$$

or

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

Graph $f(x)$ and $f^{-1}(x)$:



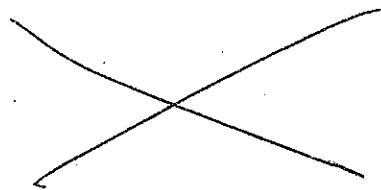
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Verify that $f(x)$ and $f^{-1}(x)$ are inverses using function composition.



State the domain and range of $f(x)$ and $f^{-1}(x)$

$$f(x)$$

$$D: (-\infty, \infty)$$

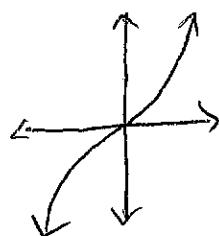
$$R: [-3, \infty)$$

$$f^{-1}(x)$$

$$D: [-3, \infty)$$

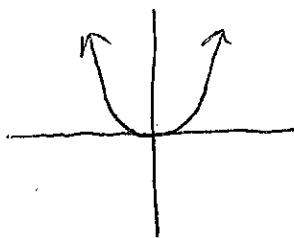
$$R: [0, \infty)$$

11. Draw the graph of a non-linear function (not a straight line) that has an inverse. Explain why the function has an inverse.



This function has an inverse because it passes the horizontal line test.

12. Draw the graph of a non-linear function (not a straight line) that does not have an inverse. Explain why the function does not have an inverse.



This function does not have an inverse because it doesn't pass the horizontal line test.

13. Find the inverse of $f(x) = \frac{x}{2} + 1$. Explain the process you used to find the inverse function.

$$\begin{aligned} x &= \frac{y}{2} + 1 \\ -1 &\quad -1 \\ 2(x-1) &= y \\ 2x-2 &= y \end{aligned}$$

$$f^{-1}(x) = 2x-2$$

- To find the inverse
- (1) switch x & y
 - (2) Solve for y
 - (3) write answer as $f^{-1}(x) = \dots$

14. What is the definition of an inverse?

An inverse function is a function that "reverses" another function.