

Tuesday 3/3/20

1. Grab Notes/Calculator
2. Put phones/earbuds away
3. Complete the Warm-up
4. Quiz Discussion
5. Characteristics of Radical Graphs Notes

Topic: Characteristics of Graphs of Radical Functions

Name: _____

What am I learning today?

Date: _____

Warm-Up

Describe the transformations to the graph.

1. $f(x) = -\sqrt{x+7}$

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

*reflect over x axis
left 7 units* *• STRETCH BY 4
• RIGHT TWO SPACES
• GO UP 5*

Write the equation of the function given the following description:

3. Has a vertical stretch of 3, is reflected over the x-axis, is shifted right 4 units.

$y = -3\sqrt{x-4}$

Vocabulary

Domain is the set of all x values.

The domain of the square root functions we will be graphing is $[\#, \infty)$ written in interval notation.

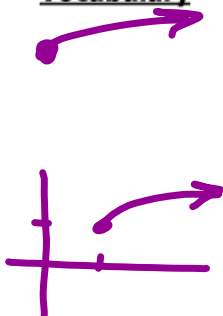
Range is the set of all y values.

The range of the square root functions we will be graphing is $[\#, \infty)$ if $a > 0$ or $(-\infty, \#]$ if $a < 0$

Intercepts graphically

X-Intercept: where the graph crosses (touches) the x-axis (can occur once or not at all).

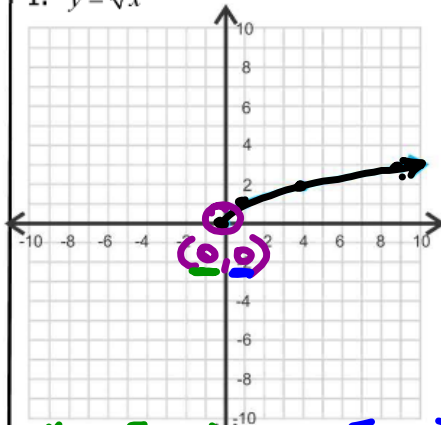
Y-Intercept: where the graph crosses (touches) the y-axis (can occur once or not at all).



Examples

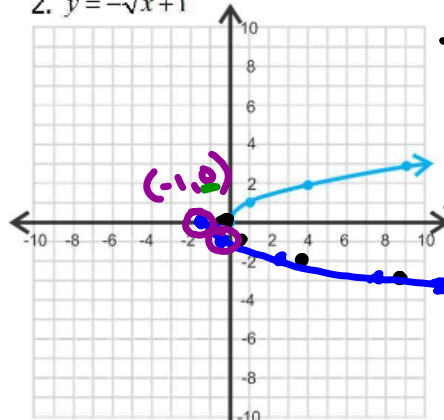
Graph the following and use the graphs to answer the questions below.

1. $y = \sqrt{x}$



Domain: $[0, \infty)$ Range: $[0, \infty)$
X-Int: $(0, 0)$ Y-Int: $(0, 0)$

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



Domain: $[-1, \infty)$ Range: $(-\infty, 0]$
X-Int: $(-1, 0)$ Y-Int: $(0, -1)$

*• Reflect over x-axis
• Left 1 unit*

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Finding Intercepts Algebraically

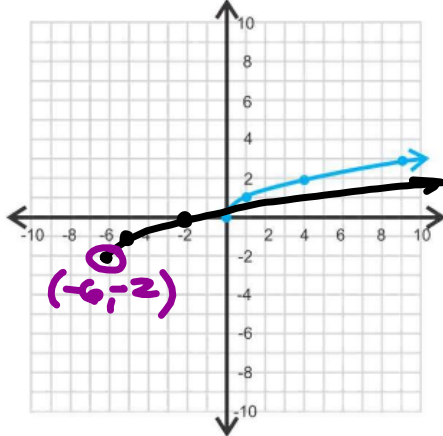
X-Intercept: because it occurs where the graph crosses the x-axis, that means $y = 0$, so, to find the x-intercept algebraically, substitute " 0 " in for y , then solve.

Y-Intercept: because it occurs where the graph crosses the y-axis, that means $x = 0$, so, to find the y-intercept algebraically, substitute " 0 " in for x , then evaluate.

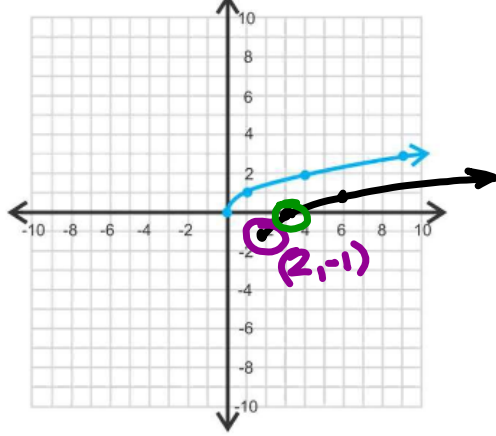
Examples

Graph the following functions. Then use the graphs to answer the questions below:

1. $y = \sqrt{x+6} - 2$ *left 6 down 2*



2. $y = \sqrt{x-2} - 1$ *right 2 down 1*



Domain: $[-6, \infty)$ Range: $[-2, \infty)$

Domain: $[2, \infty)$ Range: $[-1, \infty)$

$(y=0)$ X-Int (show work): $(-2, 0)$

$(y=0)$ X-Int (show work): $(3, 0)$

Work: $0 = \sqrt{x+6} - 2$
 $(2)^2 = (\sqrt{x+6})^2$
 $4 = x+6$ $x = -2$
 $-6 = x - 6$

Work: $0 = \sqrt{x-2} - 1$
 $(1)^2 = (\sqrt{x-2})^2$
 $1 = x-2$ $x = 3$
 $3 = x$

Check:
 $0 = \sqrt{-2+6} - 2$
 $0 = 0 \checkmark$

$0 = \sqrt{3-2} - 1$
 $0 = 0 \checkmark$

$(x=0)$ Y-Int (show work): $(0, \sqrt{6} - 2)$

$(x=0)$ Y-Int (show work): none, n/a

Work: $y = \sqrt{0+6} - 2$
 $y = \sqrt{6} - 2$
 $(0, 0.45)$

Work: $y = \sqrt{0-2} - 1$
 $y = \sqrt{-2} - 1$
Imaginary

Topic: Characteristics of Graphs of Radical Functions

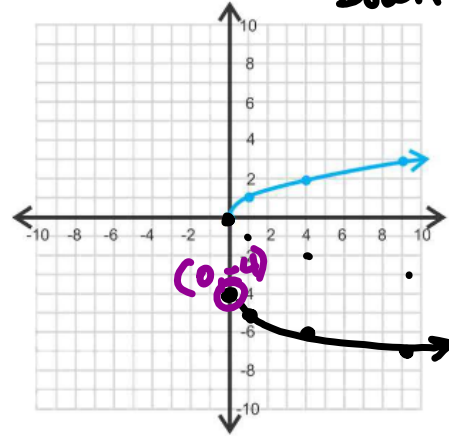
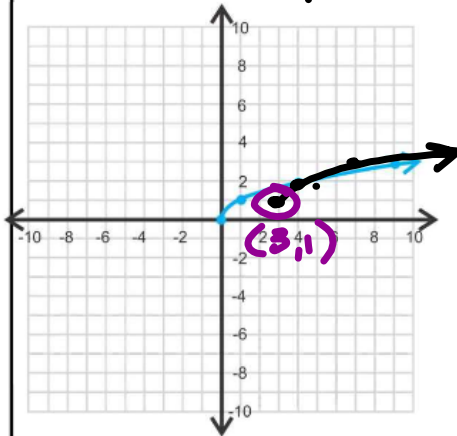
Date: _____

Examples

Graph the following functions. Then use the graphs to answer the questions below:

3. $y = \sqrt{x-3} + 1$ **Rt. 3**
Up 1

4. $y = -\sqrt{x} - 4$ **Reflect over x-axis**
Down 4



Domain: $[3, \infty)$ Range: $[1, \infty)$

Domain: $[0, \infty)$ Range: $(-\infty, -4]$

$(y=0)$

X-Int (show work): none

X-Int (show work): none

Work:
 $0 = \sqrt{x-3} + 1$
 $(-1)^2 = (\sqrt{x-3})^2$
 $1 = x - 3$
 $x = 4$ **extraneous**

Work:
 $0 = -\sqrt{x} - 4$
 $4 = -\sqrt{x}$
 $\frac{-1}{-1} = \frac{-1}{-1}$
 $-4 = \sqrt{x}$
 $x = 16$
extran.

$0 = \sqrt{4-3} + 1$
 $0 = 2$

Y-Int (show work): none

Y-Int (show work): (0, -4)

Work:
 $y = \sqrt{0-3} + 1$
 $y = \sqrt{-3} + 1$
 ↑
imaginary

Work:
 $y = -\sqrt{0} - 4$
 $y = -4$ ✓

Summary

Summarize the lesson in your own words

