

**Wednesday 2/26/20**

**1. Notes, Calculator**

**2. Take out HW/Calendar**

**3. Begin Warm-up**

**4. Transformation of Radical Graphs**

S.W.B.A.T. identify transformations that occur in a radical functions...

I.O.T. apply the transformations and accurately graph the radical function

**Topic:** Graphing Radical Functions

**Name:** \_\_\_\_\_

**What am I learning today?**

**Date:** \_\_\_\_\_

**Warm-Up**

Solve the following radical equations. Be sure to check for extraneous solutions.

1.  $\sqrt{4x+32} = x$

**CHECK**

$\sqrt{4(8)+32} = 8$   
 $8 = 8$  ✓

$\sqrt{4(-4)+32} = -4$   
 $4 = -4$  ✗

$4x+32 = x^2$   
 $0 = x^2 - 4x - 32$   
 $0 = (x-8)(x+4)$   
 $x = 8$   $x = -4$   
 extraneous

2.  $\sqrt{x-2} = \frac{16}{4}$

**CHECK**

$\sqrt{18-2} = 16$   
 $16 = 16$  ✓

$(\sqrt{x-2})^2 = (4)^2$   
 $x-2 = 16$   
 $+2 \quad +2$   
 $x = 18$

**Graph of the Square Root Function**

A **square root** function has the form

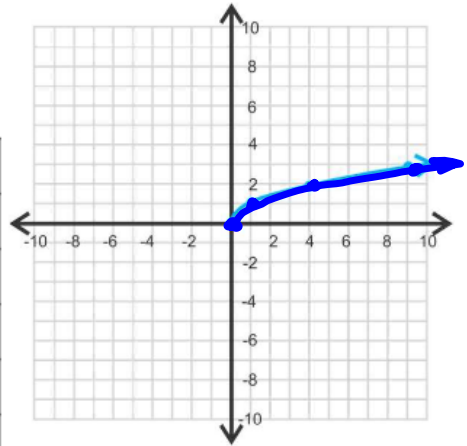
$y = a\sqrt{x-h} + k$

The **parent function** has the form

$y = \sqrt{x}$

$y = a(x-h)^2 + k$

x	y
-4	-
-1	-
0	0
1	1
4	2



A graph of the parent function is displayed to the right.

Complete the table of values for the parent function.

**Transformations of the square root function:**

$y = a\sqrt{x-h} + k$

Transformation	Equation
<b>Vertical Shift</b> • Moves the parent function either <b>UP (+)</b> or <b>DOWN (-)</b>	$f(x) = \sqrt{x} + k$ $f(x) = \sqrt{x} - k$
<b>Horizontal Shift</b> • Moves the parent function either <b>LEFT (+)</b> or <b>RIGHT (-)</b>	$f(x) = \sqrt{x+h}$ $f(x) = \sqrt{x-h}$
<b>Vertical Stretch</b> • <b>Stretch</b> on the y-axis • $a > 1$ <b>Vertical Compression (Shrink)</b> • <b>Shrink</b> on the y-axis • $0 < a < 1$	$f(x) = a\sqrt{x}$
<b>Reflection (Over x-axis)</b>	$f(x) = -\sqrt{x}$

**Topic:** Graphing Radical Functions

**Date:** \_\_\_\_\_

**Examples**

Describe the transformation(s) of each function.

1)  $y = \sqrt{x+1}$

• Left 1 unit

2)  $y = -\sqrt{x-4}$

• Reflects over x-axis  
• Down 4

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

• Vert. stretch by factor of 2  
• Right 2 units.  
• Up 1 units.

Write an equation using the following characteristics.

1) a radical that shifts up 2 and right 3

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

2) A radical that shifts left 4 and is reflected

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

3) a radical has a vertical shrink of  $\frac{1}{2}$  and shifts down 1 and left 5

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

**Steps for Graphing**

- 1) Start by graphing the parent function.
- 2) Describe the transformation(s) of the graph.
- 3) Graph the transformation(s) and sketch the curve.

**\*\*Graph all reflections FIRST**

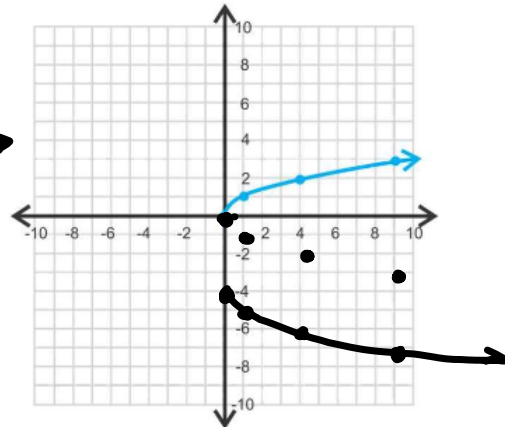
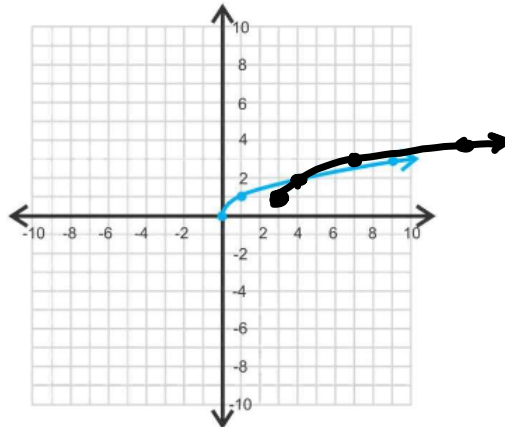
Examples:

1)  $y = \sqrt{x-3}+1$

Transformations:  
• Right 3  
• Up 1

2)  $y = -\sqrt{x-4}$

Transformations:  
• Reflects over x-axis.  
• Down 4



**Summary**

Summarize the lesson in your own words