Algebra 2 6.3

Graph and analyze square root functions

Graph square root inequalities

parent graph

square root function

radical function

domain

range

equation

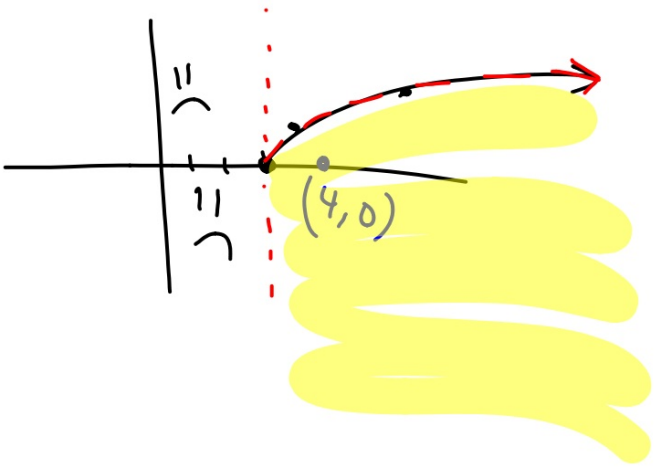
☆ inequality

whiteboards

$0 < \sqrt{4-3}$ $0 < \sqrt{1}$

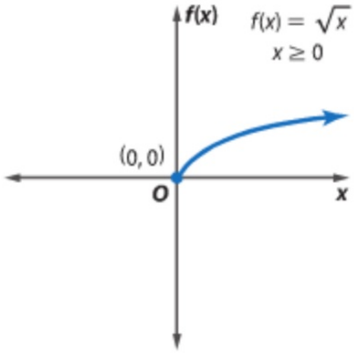
$0 < 1$

$y < \sqrt{x-3}$



KeyConcept Parent Function of Square Root Functions

Parent function:	$f(x) = \sqrt{x}$
Domain:	$\{x \mid x \geq 0\}$
Range:	$\{f(x) \mid f(x) \geq 0\}$
Intercepts:	$x = 0, f(x) = 0$
Not defined:	$x < 0$
End behavior:	$x \to 0, f(x) \to 0$
	$x \to +\infty, f(x) \to +\infty$



The domain of a square root function is limited to values for which the function is defined.

KeyConcept Transformations of Square Root Functions

$$f(x) = a\sqrt{x - h} + k$$

***h*—Horizontal Translation**	***k*—Vertical Translation**

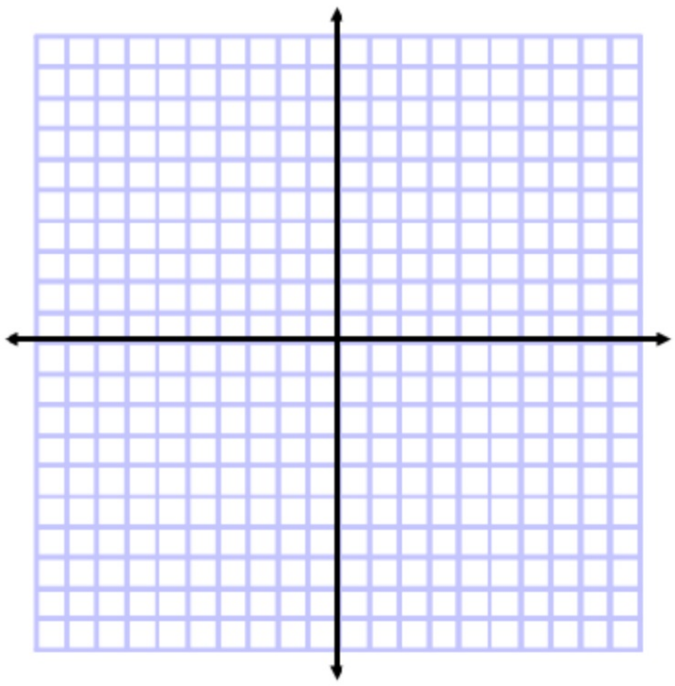
***a*—Orientation and Shape**

- If $a < 0$, the graph is reflected across the x-axis.
- If $|a| > 1$, the graph is stretched vertically.
- If $0 < |a| < 1$, the graph is compressed vertically.

Graph each function. State the domain and range.

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

5. $f(x) = 3\sqrt{x - 1}$



No man's land...

2 Square Root Inequalities

A **square root inequality** is an inequality involving square roots. They are graphed using the same method as other inequalities.

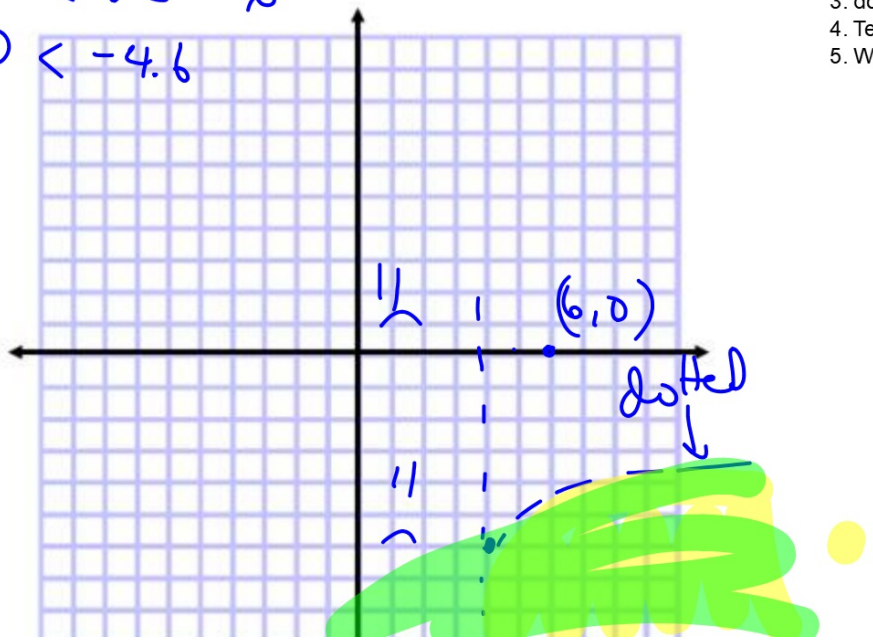
Example 4 Graph a Square Root Inequality

Graph $y < \sqrt{x-4} - 6$.

$0 < \sqrt{6-4} - 6$

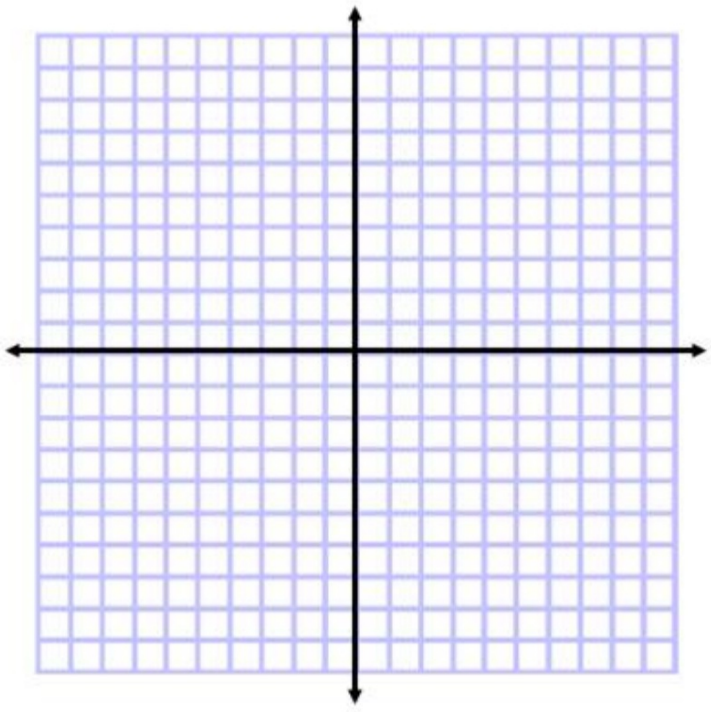
$0 < \sqrt{2} - 6$

$0 < -4.6$



1. boundary (parent graph) ==
2. Solid or dotted boundary?
3. domain?
4. Test point and shade
5. Watch out for no-man's land

4B. $f(x) < -\sqrt{x+2} - 4$



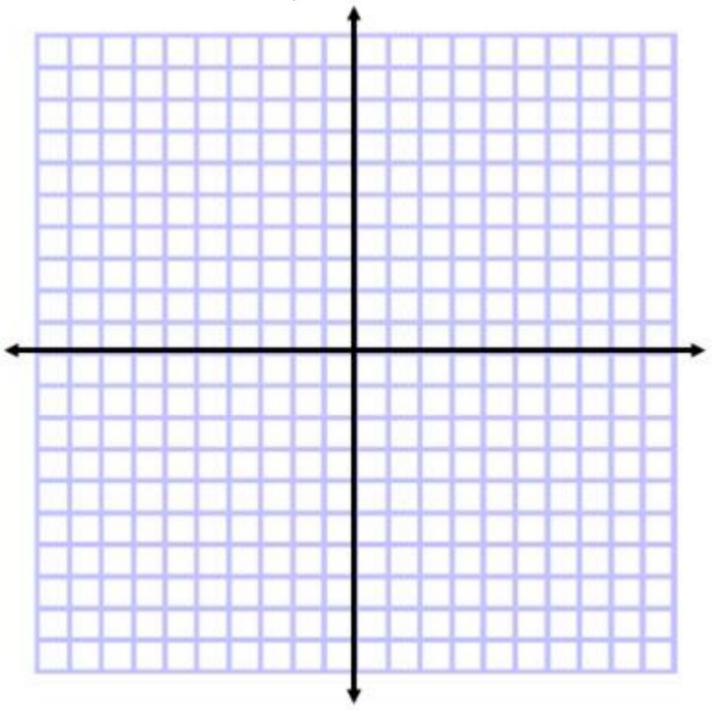
GuidedPractice

4A. $f(x) \geq \sqrt{2x+1}$

What about the 2?

1.4

$\sqrt{2\left(x+\frac{1}{2}\right)} = \sqrt{2}\cdot\sqrt{x+\frac{1}{2}}$



6.3 WB
skills