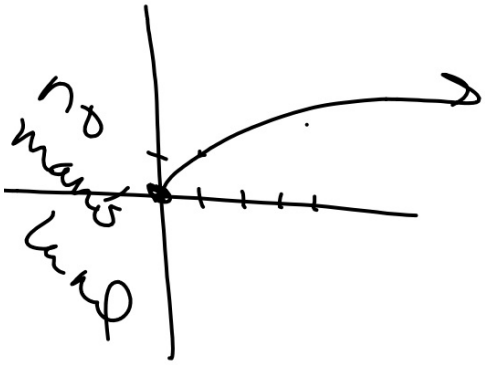
Algebra 2 6.3

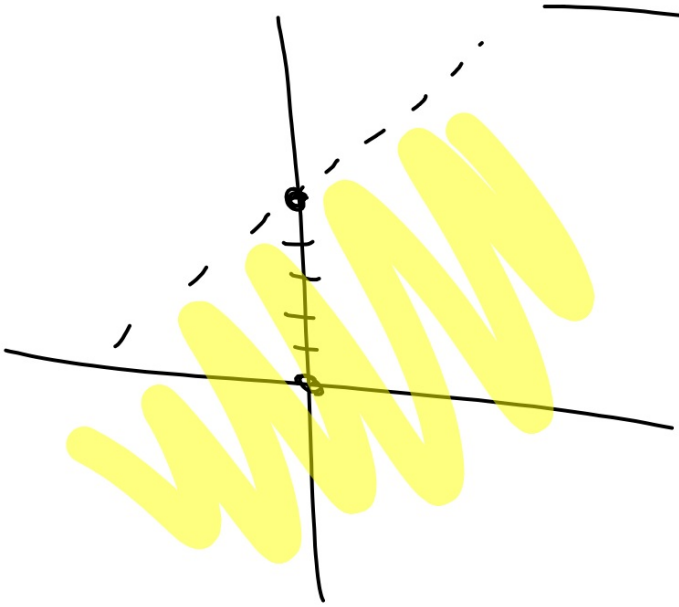
Graph and analyze square root functions

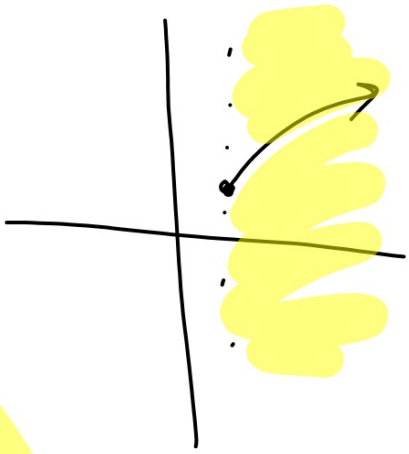
Graph square root inequalities

parent graph
square root function
radical function
domain
range
equation
inequality

$y < x + 5$

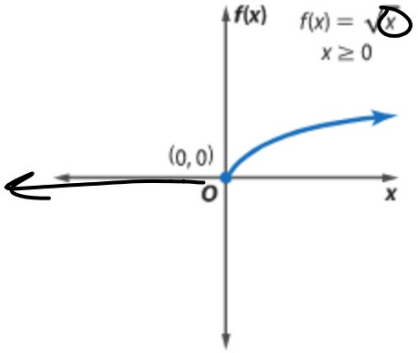






KeyConcept Parent Function of Square Root Functions

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**

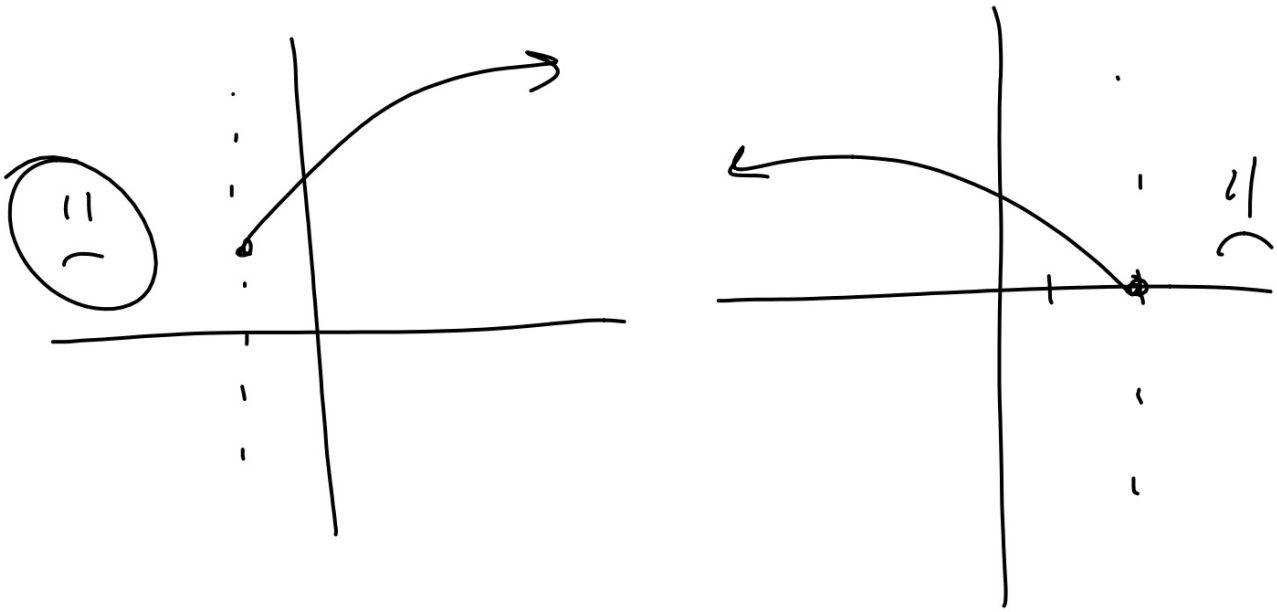
***k*—Vertical Translation**

***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.

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

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.

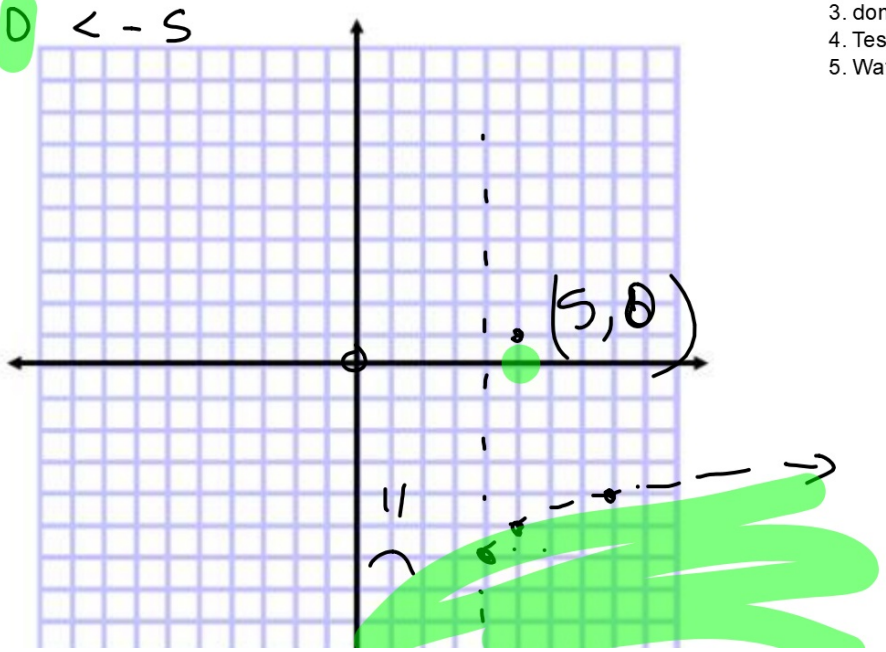
Example 4 Graph a Square Root Inequality

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

$0 < \sqrt{5-4} - 6$

$0 < 1 - 6$

$0 < -5$



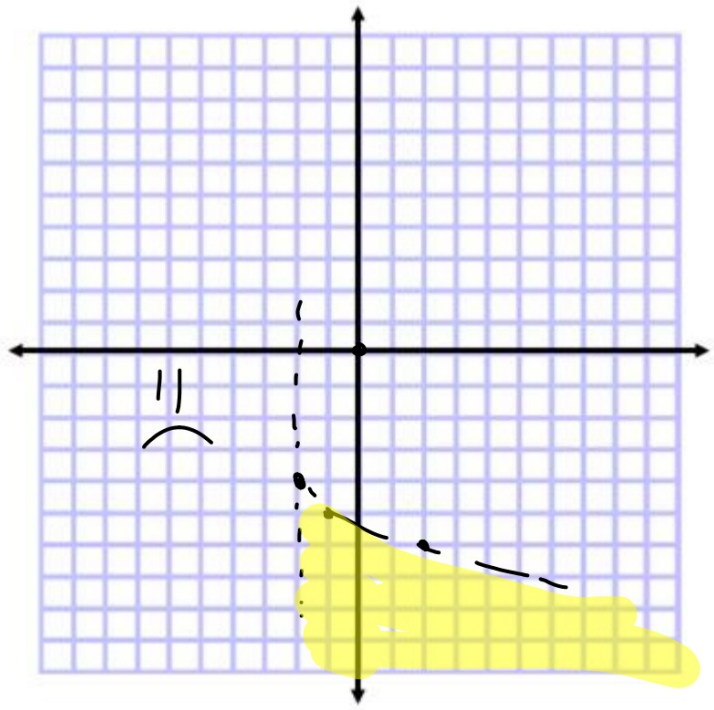
1. boundary (parent graph) ==
2. Solid or dotted boundary?
3. domain?
4. Test point and shade
5. Watch out for no-man's land

$0 < -\sqrt{2} - 4$

$0 < -1.4 - 4$ $\quad 0 < -5.4$

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

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



What about the 2?

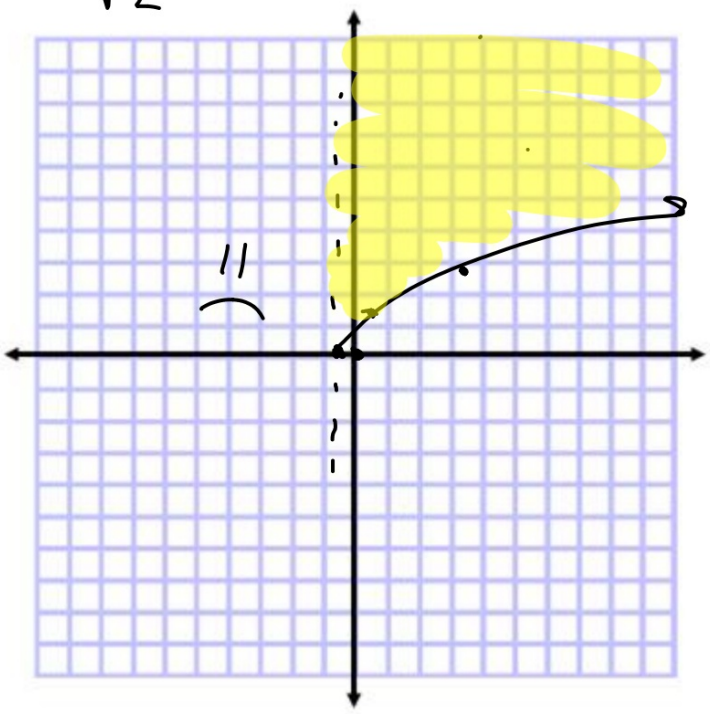
GuidedPractice

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

$0 \geq \sqrt{0+1}$

$y = \sqrt{2}(x+\frac{1}{2})$ $0 \geq \sqrt{1}$

$0 >$



WB 6.3 prac
1-10