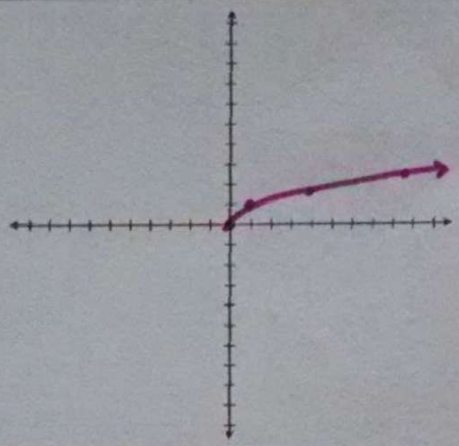
GRAPHING RADICAL FUNCTIONS

Radical Square Root Parent Function

$y = \sqrt{x}$

x	y
0	0
1	1
4	2
9	3



$|a|$ gives a vertical stretch or compression
- $a > 0$ → UPWARD
- $a < 0$ → DOWNWARD

h represents a horizontal translation (x – coordinate of starting point)

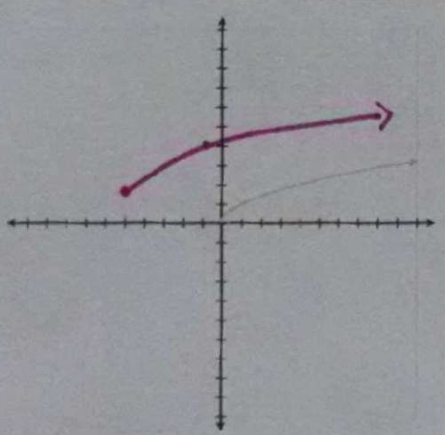
$$y = a\sqrt{\frac{1}{b}(x - h)} + k$$

$|b|$ gives horizontal stretch or compression
- $b > 0$ → RIGHT
- $b < 0$ → LEFT

k represents a vertical translation (y – coordinate of starting point)

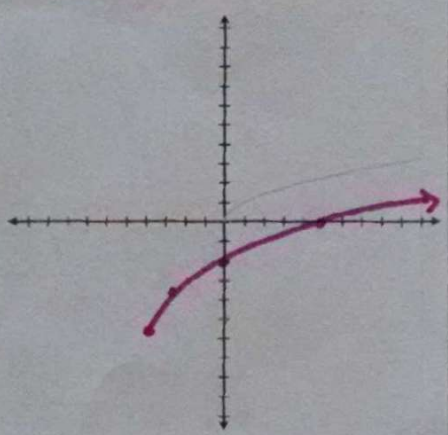
$y = \sqrt{x+5} + 2$

Start at (-5, 2)



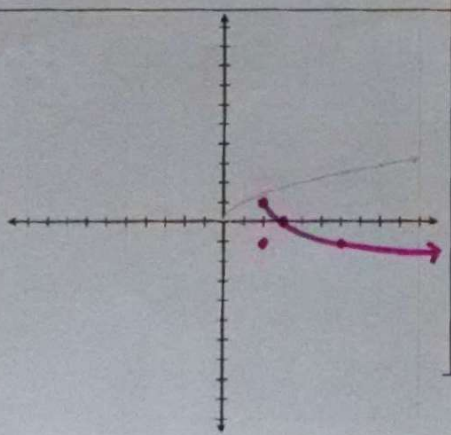
$y = 2\sqrt{x+4} - 6$

Start at (-4, -6)



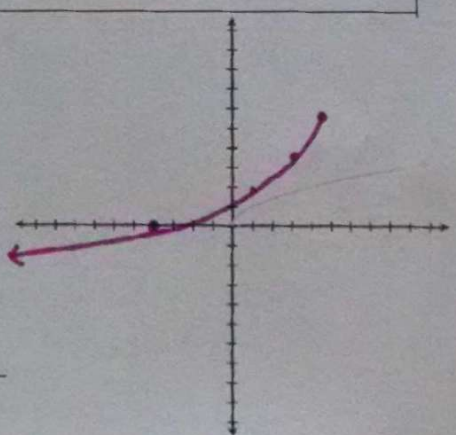
$y = -\sqrt{x-2} + 1$

Start at (2, 1)



$y = -2\sqrt{-(x-5)} + 6$

Start at (5, +6



Solving Radical Equations

Remember $y = \sqrt{x}$ and $y = x^2$ are inverse functions… so they "undo" each other.

- Undo a Square Root by Squaring BOTH sides
- $\sqrt[3]{x}$ is undone by raising BOTH sides to the 3rd power
- $\sqrt[4]{x}$ is undone by raising BOTH sides to the 4th power

$(\sqrt{x-3})^2 = 3^2$

$x - 3 = 9$

$\boxed{x = 12}$

$\frac{4\sqrt[3]{x+1}}{4} = \frac{16}{4}$

$(\sqrt[3]{x+1})^3 = 4^3$

$x + 1 = 64$

$\boxed{x = 63}$

$\frac{2\sqrt[4]{2x-4}}{2} = \frac{4}{2}$

$(\sqrt[4]{2x-4})^4 = 2^4$

$2x - 4 = 16$

$2x = 20$

$\boxed{x = 10}$

$\sqrt{x+6} - 2 = 3$

$+2 \quad +2$

$(\sqrt{x+6})^2 = 5^2$

$x + 6 = 25$

$x = 19$

$(\sqrt{8x+1})^2 = (x+2)^2$

$8x + 1 = (x+2)(x+2)$

$8x + 1 = x^2 + 4x + 4$

$0 = x^2 - 4x + 3$

$0 = (x-1)(x-3)$

$\boxed{x = 1, 3}$

$(\sqrt{3x-11})^2 = (x-3)^2$

$3x - 11 = (x-3)(x-3)$

$3x - 11 = x^2 - 6x + 9$

$0 = x^2 - 9x + 20$

$0 = (x-5)(x-4)$

$\boxed{x = 5, 4}$

GLUE HERE