Alg 2 Trig

7.3 – Square Root Functions and Inequalities

What would the inverse of a quadratic function look like?
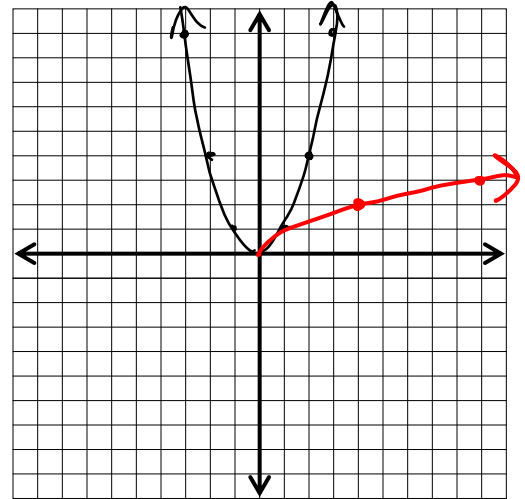
$y = x^2$

What would be an easy way to find it quickly?
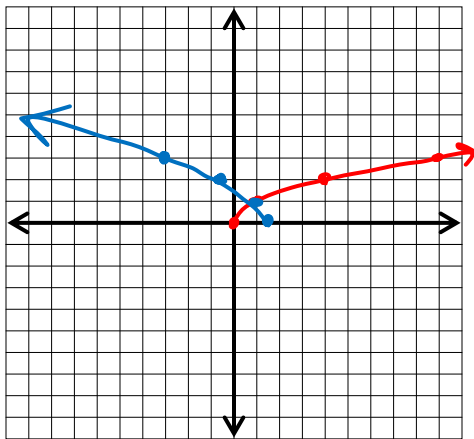
$y = x^2$

$x = y^2$

$\boxed{\sqrt{x} = y}$

Square Root Functions: *a function where the variable is underneath the $\sqrt{}$ sign*

Parent Function: $y = \sqrt{x}$

Example 1: Graph $y = \sqrt{-2x + 3}$ and state the domain, range, and x- and y-intercepts.

① Left 3
② Reflect over y
③ shrink by $\frac{1}{2}$

d: $x \leq 1.5$

r: $y \geq 0$

x-int: $(1.5, 0)$ (where y=0)

y-int: $(0, \sqrt{3})$ (where x=0)

$\boxed{y = 0}$
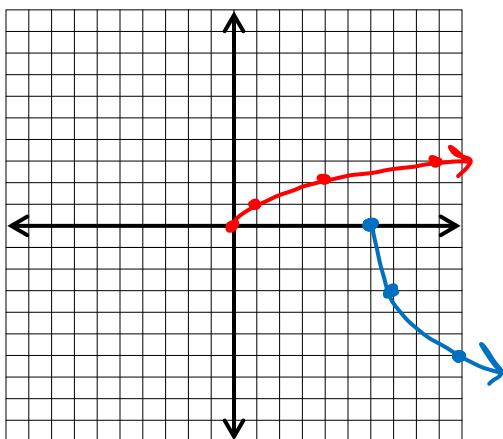$0 = \sqrt{-2x+3}$
$0 = -2x + 3$
$-3 = -2x$
$1.5 = x$

$\boxed{x = 0}$
$y = \sqrt{-2(0)+3}$
$y = \sqrt{3}$

Try it! Graph $y = -3\sqrt{x} - 6$ and state the domain, range, and x- and y-intercepts.

① Right 6
① Stretch by 3
② Reflect over x

d: $x \geq 6$

r: $y \leq 0$

x-int: $(6, 0)$
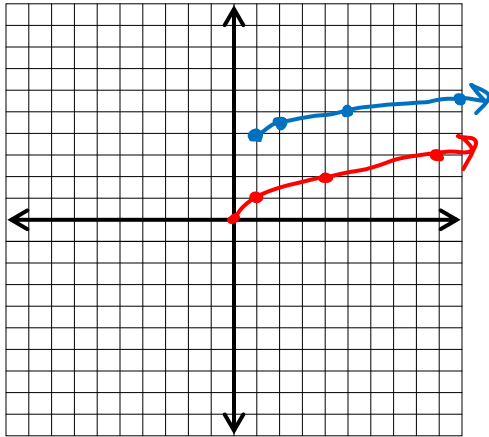
y-int: none

Try another: Graph $y = \dfrac{1}{2}\sqrt{x-1} + 4$ and state the domain, range, and x- and y-intercepts.

V   H   V

H

① Right 1

V

① Shrink by $\dfrac{1}{2}$

② up 4

d: $x \geq 1$

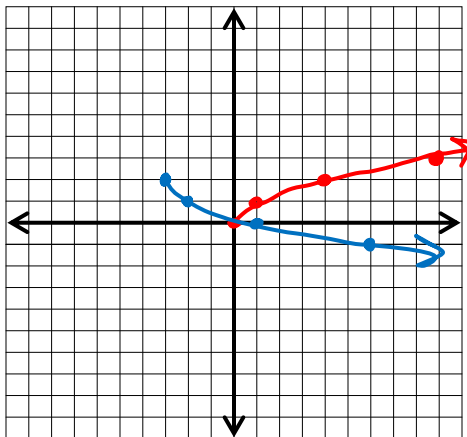r: $y \geq 4$

x-int: none

y-int: none

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

Graph $y = 2 - \sqrt{x+3}$ and state the domain, range, and x- and y-intercepts.

V V   H

H

① Left 3

V

① Reflect over x

② up 2

d: $x \geq 3$

r: $y \leq 2$

x-int: $(1,0)$
$(y=0)$

y-int.: $\left(0, 2-\sqrt{3}\right)$
$(x=0)$

$y=0$

$0 = 2 - \sqrt{x+3}$

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

$4 = x+3$

$1 = x$

$x=0$

$y = 2 - \sqrt{3}$