4/17 Radical Functions

$\sqrt{-3}$

The Real Number System

rational #: Any # that can be written $\frac{a}{b}$, $b \neq 0$

Rational #s	Irrational #s
Integers: -11, $-\sqrt{25}$; Whole #s: 0, 10, $7\frac{6}{2}$, $\sqrt{16}$; $-\frac{3}{4}$; $0.\overline{3} = \frac{1}{3}$; $0.29 = \frac{29}{100}$	π, $\sqrt{\pi}$, $\sqrt{2}$, $\sqrt{3}$, $\sqrt{28}$, $-\sqrt{3}$; decimals that never end and never repeat.

Irrational #s: #s that cannot be written as fractions

radical symbol $\sqrt{}$

radical expression - an expression that contains a radical, such as a square root, cube root, or any other root.

square root $\sqrt{}$

radical function - contains a radical expression with the independent variable in the radicand.

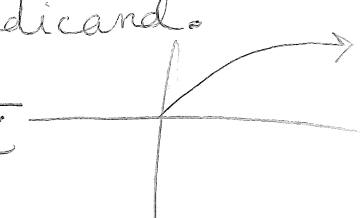
cube root $\sqrt[3]{}$

radicand - the # or expression inside the radical symbol.

fourth root $\sqrt[4]{}$

square root function - the radical is a square root. The independent variable is in the radicand.

Parent square root function: $y = \sqrt{x}$



compare to $y=\sqrt{x}$

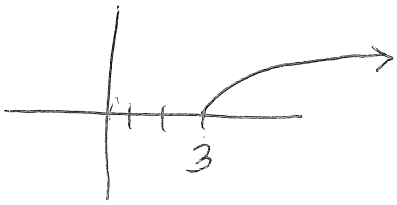
$y=3\sqrt{x}$ vertical stretch (by a factor of 3)

$y=\frac{1}{2}\sqrt{x}$ vertical shrink (by a factor of $\frac{1}{2}$)

$y=\sqrt{x}-2$ translates two units down.

$y=-2\sqrt{x}$ reflection over the x-axis
vertical stretch (by factor of 2.)

$y=\sqrt{x-3}$



3 units to the right.

$\{x \mid x \geq 3\}$

$y=-\frac{1}{4}\sqrt{x}-3$

"$\frac{1}{4}$" vertical shrink
"$-$" reflection over x-axis
"-3" translate 3 units down

Perfect Square #s

1
4
9
16
25
36

Simplify Square Roots

$\sqrt{24}=\sqrt{4\cdot 6}$

$\sqrt{4}\cdot\sqrt{6}$

$\sqrt{24}=\boxed{2\sqrt{6}}$ Simplest Radical Form

$\sqrt{48}=\sqrt{16\cdot 3}$ $16\cdot 3$

$\sqrt{16}\cdot\sqrt{3}$

$\sqrt{48}=\boxed{4\sqrt{3}}$