10-1 Square Root Functions

Goals:
1. Graph and analyze dilations of radical functions.
2. Graph and analyze reflections and translations of radical functions.

Radical Function
A square root function contains the square root of a variable.

\[ f(x) = \sqrt{x} \]

**Generic Equation**

Parent Graph

\[
\begin{align*}
    f(x) &= a\sqrt{x} + h + k \\
    y &= \sqrt{x} \\
    y &= 2\sqrt{x} \\
    y &= -\sqrt{x} \\
    y &= \sqrt{x} + 1 \\
    y &= \sqrt{x} - 2
\end{align*}
\]

**Domain:**
\[ (x \geq 0) \]

**Range:**
\[ (y \geq 0) \]

**Tips & Strategies:**
- Always go through the points (0,0) and (1,a).
- The domain is \( x \geq 0 \), and the range in \( y \geq 0 \). Notice that the graph is increasing on the entire domain, the minimum value is \( 0 \), and there is no symmetry.
Our friends \((h,k)\) are back telling us where the graph has moved from the parent graph. "\(h\)" always comes out opposite sign, "\(k\)" always comes out same sign.

Graph the function. Compare to the parent graph. State the domain and range.
Graph $y = \frac{1}{2}\sqrt{x}$ and compare the parent graph. State the domain and range.

Graph $y = -\sqrt{x} - 1$ and compare the parent graph. State the domain and range.

10-1 Assignment
Page 624: 15-39 every 3rd problem, 41