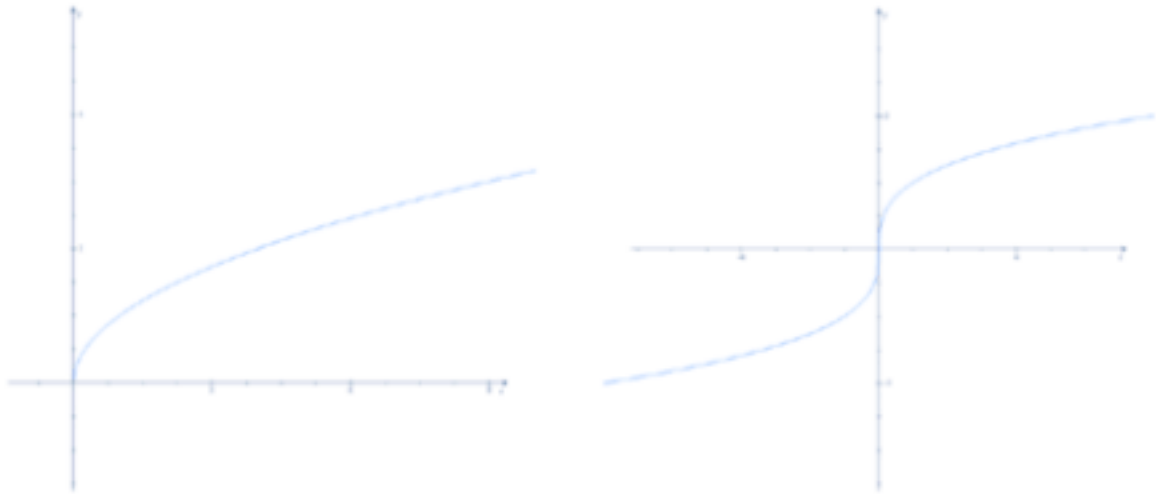
Lesson 7-6: Graphing Square Root and Cube Root Functions

Oh yeah! Graphing baby! Our favorite right? <cough> Yeah, right Mr. T.

Okay, I know you're not fond of graphing…but…please don't let this throw you. You already know the basics. All we're going to do today is learn what the graphs of $f(x)=\sqrt{x}$ and $f(x)=\sqrt[3]{x}$ functions look like and how the basic translations work. You already know how the translations work. It will be exactly the same as all the graphs we've been working with. You will just apply what you know to some new graphs.

Graphs of the basic radical functions

All we're going to worry about is graphs for square root $f(x)=\sqrt{x}$ and cube root $f(x)=\sqrt[3]{x}$ functions. The first step is being able to recognize graphs of these two functions and tell them apart. Here are their graphs…square root on the left, cube root on the right:



Square root graph $f(x)=\sqrt{x}$

- It looks like ½ of a parabola on its side.
- It starts at the vertex.
- Domain: $x \geq 0$
- Range: $y \geq 0$
- Key plotting points:
  - (0, 0), (1, 1), (4, 2), (9, 3)
- Stepping: Up 1…right 1, 3, 5

Cube root graph $f(x)=\sqrt[3]{x}$

- It looks like a squashed "S".
- The "twist" happens at the vertex.
- Domain: $\mathbb{R}$ … all real numbers
- Range: $\mathbb{R}$ … all real numbers
- Key plotting points:
  - (-8,-2), (-1,-1), (0, 0), (1,1), (8, 2)
- Stepping: Up 1…right 1, 7
  Down 1…left 1, 7

So, *S* shape…cubed root. Half a parabola on its side…square root.