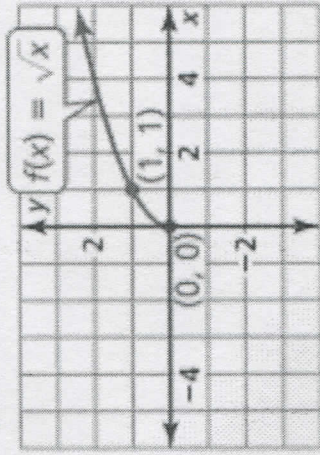


A radical function contains a radical expression with the independent variable in the radicand.

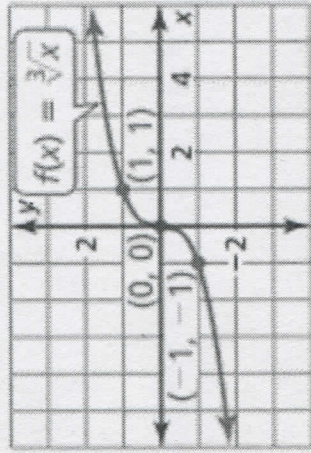
**OBJECTIVE 1: Parent Functions for Square and Cube Root Functions**

Square Root



Domain:  $x \geq 0$ , Range:  $y \geq 0$

Cube Root



Domain and range: All real numbers

**TASK 1:** Stating the domain and range in interval notation

a) for the parent square root function

D:  $[0, \infty)$  R:  $[0, \infty)$

b) for the parent cube root function

D:  $(-\infty, \infty)$  R:  $(-\infty, \infty)$

**STEPS:**

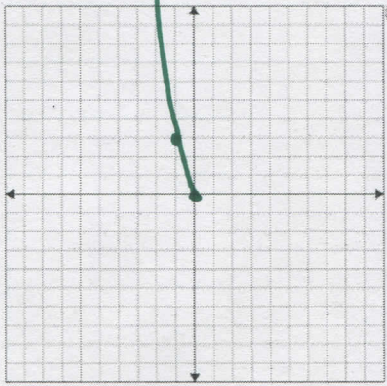
1. Pick x values (be strategic)
2. Plug those in x values in to get your values
3. Use your values to create a t-chart
4. Use your t-chart to graph the function
5. Restrict your domain, if necessary
  - a. Rule 1: radicand  $\geq 0$
  - b. Rule 2: denominator cannot = 0
  - c. Rule 3: radicand in the denominator  $> 0$



**TASK 2:** Graph the functions provided. List your points you used in a table.

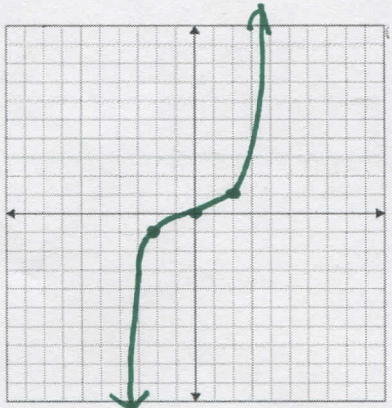
a)  $f(x) = \sqrt{\frac{1}{3}x}$

x	y
3	1
12	2
27	3



b)  $g(x) = -2\sqrt[3]{x}$

x	y
-1	2
0	0
1	-2



**OBJECTIVE 2: Radical Transformations**

**TASK 3:** Describe the transformations from  $f(x)$  to  $g(x)$ . Then given the domain restrictions.

a)  $g(x) = \sqrt{x+2} - 3$

$\leftarrow 2u \downarrow 3u$

$x+2 \geq 0 \Rightarrow x \geq -2 \Rightarrow [-2, \infty)$

b)  $g(x) = -\sqrt[3]{2x}$

$R_x; HC \frac{1}{2}$   
 $(-\infty, \infty)$

**TASK 4:** Write radical functions with transformations.

a) Parent square root function, transformed by a horizontal stretch of 6 and a translation down 2 units.

$f(x) = \sqrt{x}$        $g(x) = \sqrt{\frac{1}{6}x} - 2$

b) Parent cube root function, transformed by a vertical stretch of 2, reflection over the y-axis, and a translation right 2 units.

$f(x) = \sqrt[3]{x}$        $g(x) = 2\sqrt[3]{-(x-2)} = 2\sqrt[3]{-x+2}$

c) Parent square root function, transformed left 3 units, down 4 units, reflected across the x-axis, vertically stretched by 2, and horizontally compressed by 7.

$f(x) = \sqrt{x}$        $g(x) = -2\sqrt{\frac{1}{7}(x)+3}$

Still need help with: