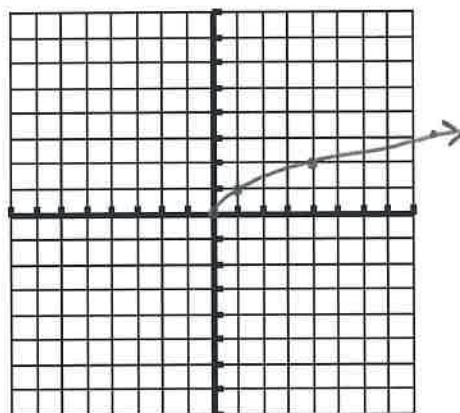


5.3 Guided Notes – Graphing Radical Functions

Name Key

Square Root Parent Function: $f(x) = \sqrt{x}$

x	y
0	0
1	1
4	2
9	3



Domain: $x \in [0, \infty)$

Range: $y \in [0, \infty)$

Transformed Radical Function:

$$y = a^n \sqrt{x - h} + k$$

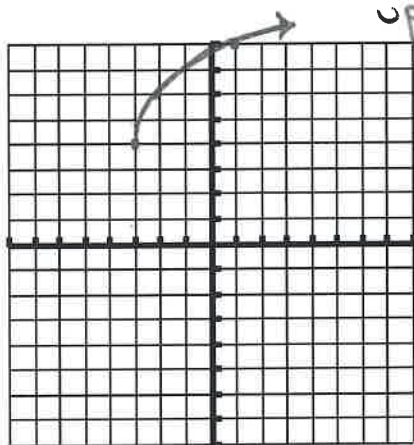
vertical dilation
horizontal translation
vertical translation

For the following square root functions, describe the transformations from the parent function and graph. Then describe the features of the graph.

1) $g(x) = 2\sqrt{x+3} + 4$

Description:

vertical dilation of 2
translated left 3
up 4



Domain: $x \in [-3, \infty)$

Range: $y \in [4, \infty)$

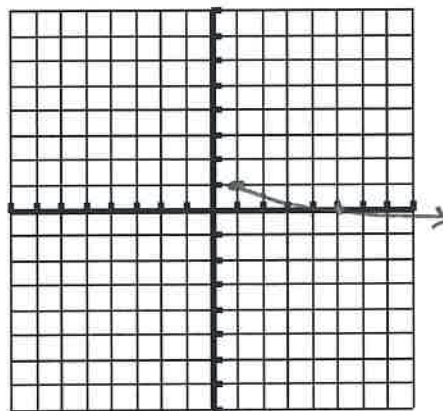
State the interval of x where $g(x)$ is increasing: $x \in [-3, \infty)$

State the interval of x where $g(x) > 0$: $x \in [-3, \infty)$

2) $m(x) = -\frac{1}{2}\sqrt{x-1} + 1$

Description:

Reflected over x-axis
VD of 1/2
translated right 1, up 1



Domain: $x \in [1, \infty)$

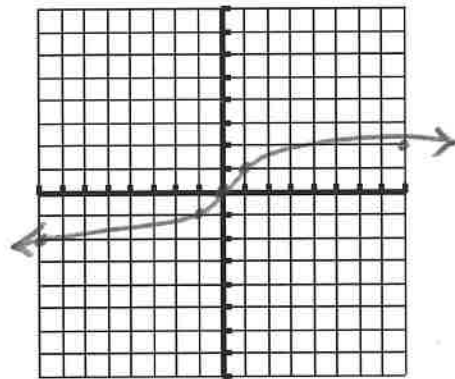
Range: $y \in (-\infty, 1]$

State the interval of x where $m(x)$ is decreasing: $x \in [1, \infty)$

State the interval of x where $m(x) < 0$: $x \in (5, \infty)$

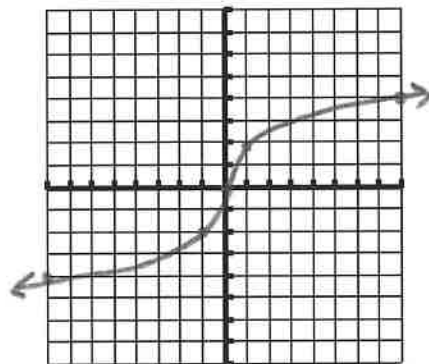
Parent Function of a Cubic Function: $f(x) = \sqrt[3]{x}$

x	y
-8	-2
-1	-1
0	0
1	1
8	2



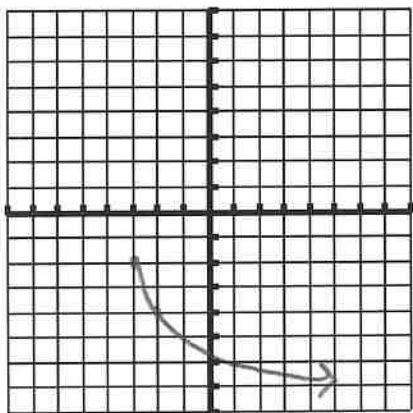
Graph: $f(x) = \sqrt[3]{8x}$

Rewrite as $f(x) = 2^3 \sqrt[3]{x}$
 ↑
 VO of 2

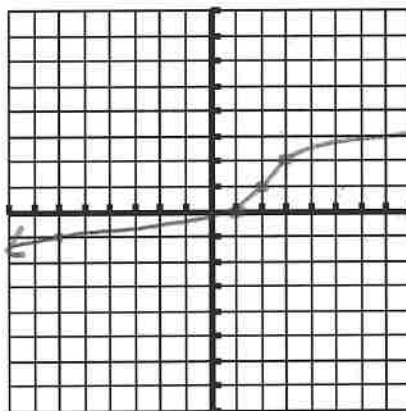


You Try!

1) $m(x) = -2\sqrt{x+3} - 2$



2) $n(x) = \sqrt[3]{x-2} + 1$



Example:

Looking out to the sea, the visibility in miles from a certain spot on a cliff can be calculated with the function

$d(x) = \sqrt{1.5x}$, where x is the height in feet above sea level.

a) What is the visibility 5 feet above sea level?

$$d(5) = \sqrt{1.5(5)} = 2.739 \text{ mi}$$

b) What is the visibility 40 feet above sea level?

$$d(40) = \sqrt{1.5(40)} = 7.746 \text{ mi}$$