3.5 Graphs of Square Roots & Cube Roots

"This is the math department at State U. Send over a pizza that's half pepper, half onion, and half peperoni."

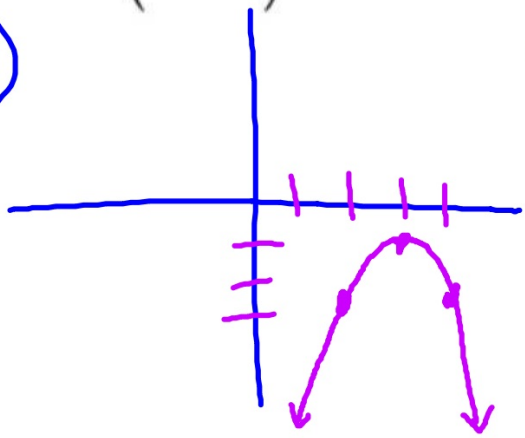
REVIEW

ex: Sketch and state the domain and range in interval notation.

$$y = -2(x-3)^2 - 1$$

Vertex: $(3, -1)$

x	y
2	-3
3	-1
4	-3



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

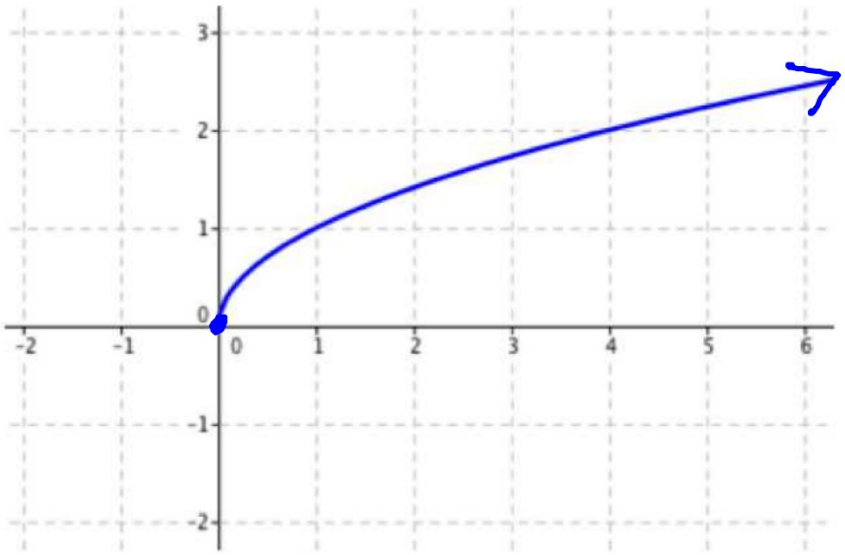
R: $(-\infty, -1]$

Square Root Graphs

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

Graph:

x	y
0	0
1	1
4	2



Domain: $[0, \infty)$

Range: $[0, \infty)$

ex: Sketch and state the domain and range in interval notation.

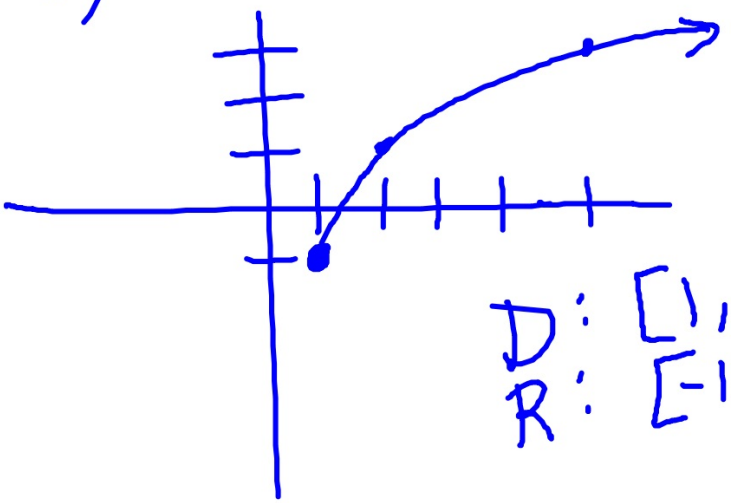
$y = a(x-h)^2 + k$

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

a) $y = 2\sqrt{x-1} - 1$

Start pt. $(1, -1)$

x	y
1	-1
2	1
5	3



D: $[1, \infty)$

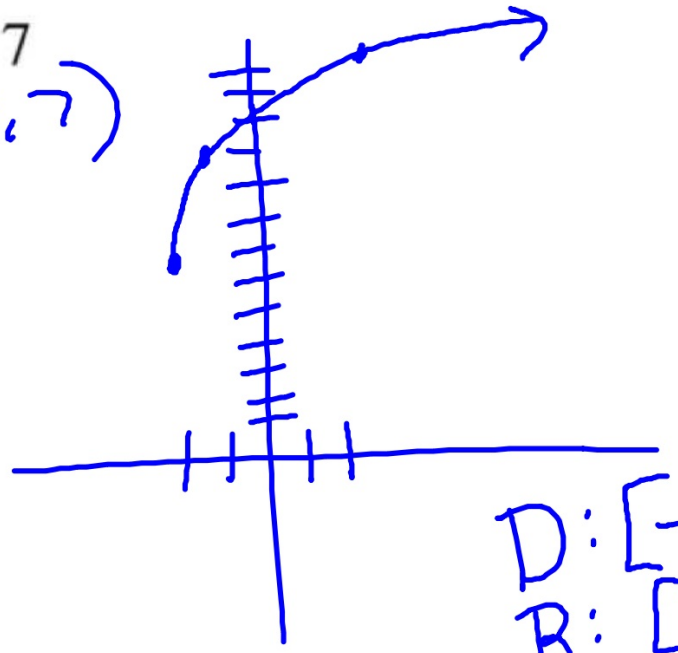
R: $[-1, \infty)$

ex: Sketch and state the domain and range in interval notation.

b) $y = 3\sqrt{x+2} + 7$

start pt $(-2, 7)$

x	y
-2	7
-1	10
2	13



1
4
9
16
25

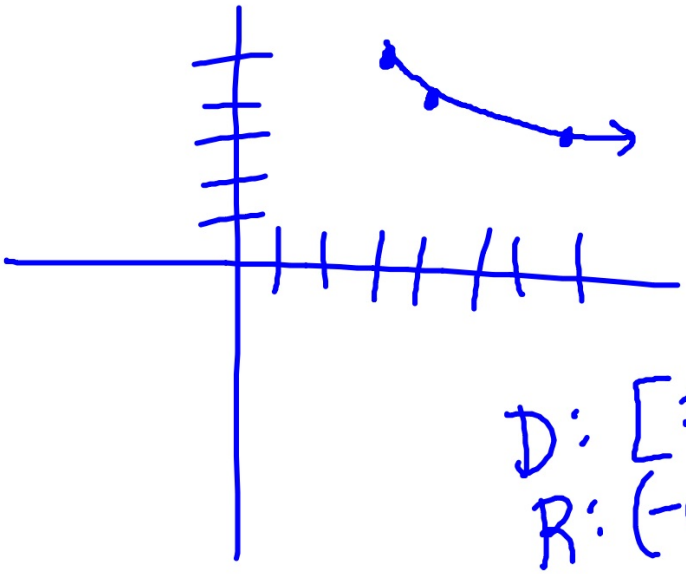
D: $[-2, \infty)$
R: $[7, \infty)$

ex: Sketch and state the domain and range in interval notation.

c) $y = -\sqrt{x-3} + 5$

Start $(3, 5)$

x	y
3	5
4	4
7	3



D: $[3, \infty)$

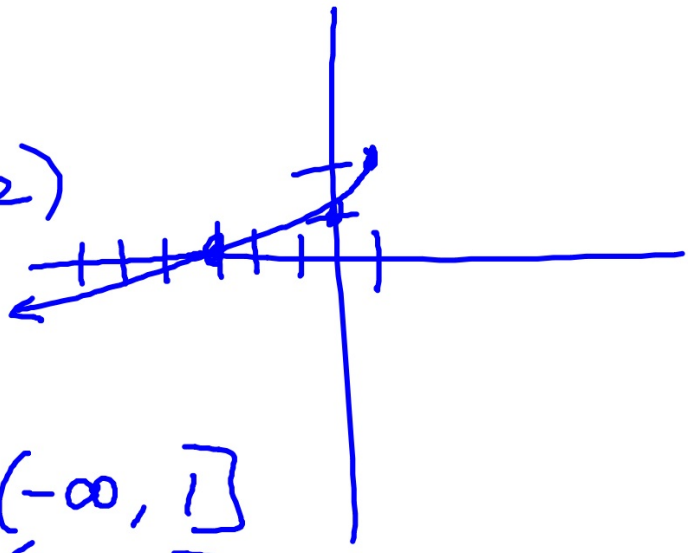
R: $(-\infty, 5]$

ex: Sketch and state the domain and range in interval notation.

d) $y = 2 - \sqrt{1 - x}$

Start : (1, 2)

x	y
1	2
0	1
-3	0



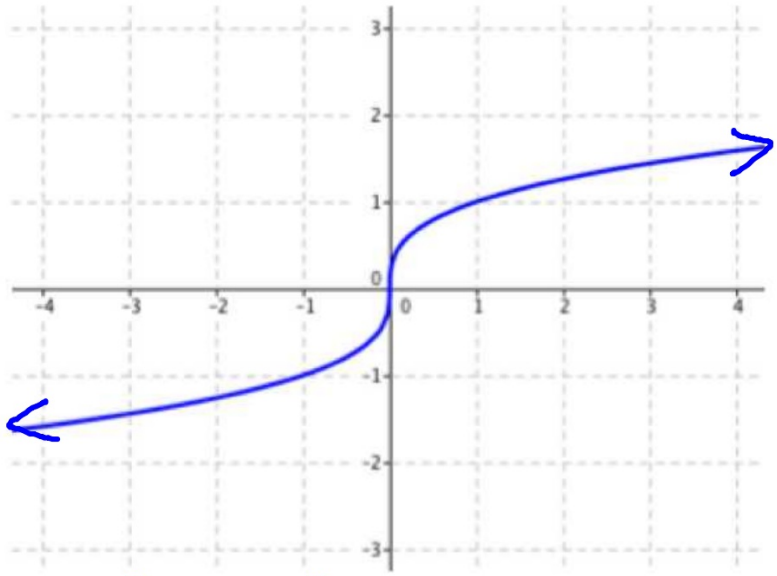
D: $(-\infty, 1]$

R: $(-\infty, 2]$

Cube Root Graphs

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

Graph:



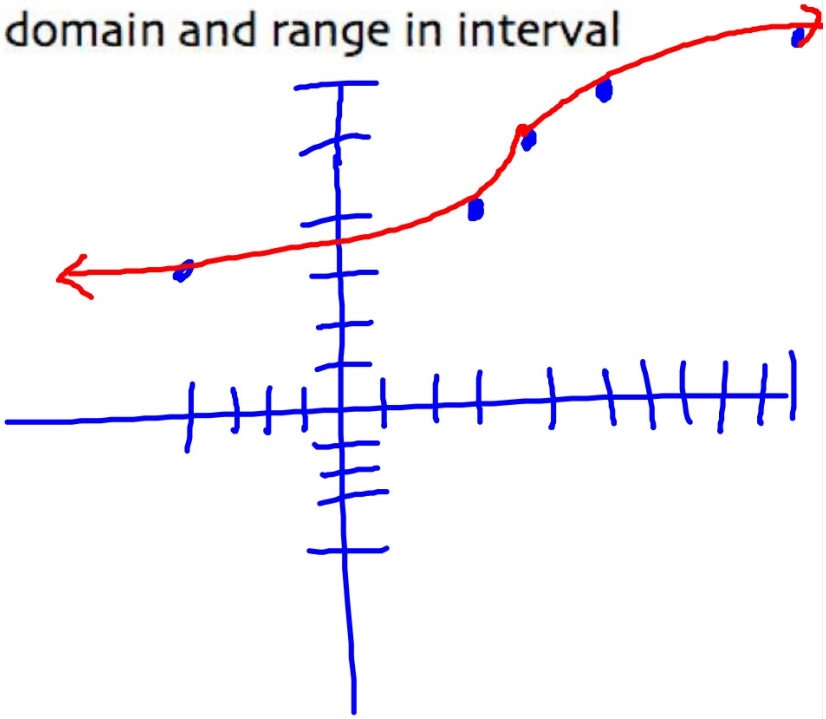
Domain: $(-\infty, \infty)$ Range: $(-\infty, \infty)$

ex: Sketch and state the domain and range in interval notation.

f) $y = \sqrt[3]{x-4} + 5$

start : (4,5)

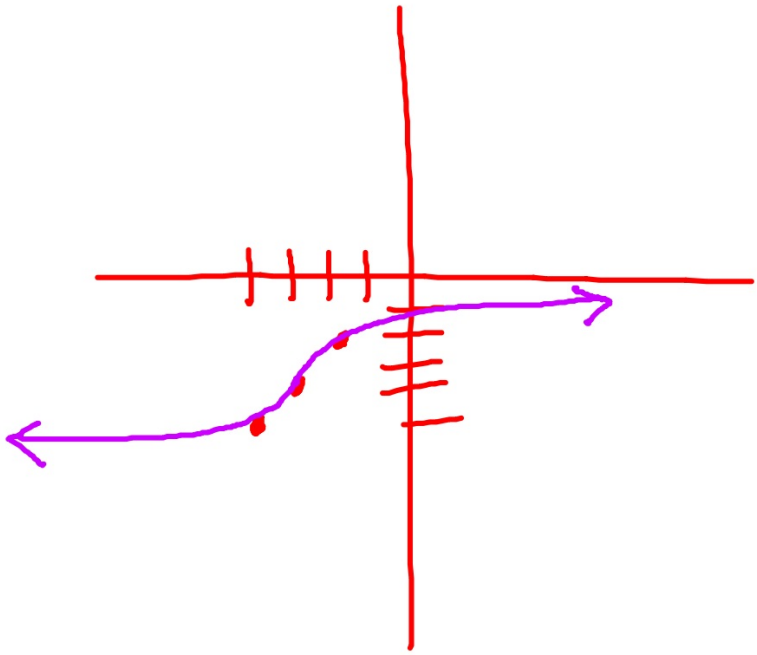
x	y
-4	3
3	4
→ 4	5
5	6
12	7



ex: Sketch and state the domain and range in interval notation.

g) $y = \sqrt[3]{x+3} - 4$

x	y
-4	-5
-3	-4
-2	-3



$$y = 3\sqrt{2x - 10} + 4$$

$$y = 3\sqrt{2(x - 5)} + 4$$

Key point
(starting point): (5, 4)