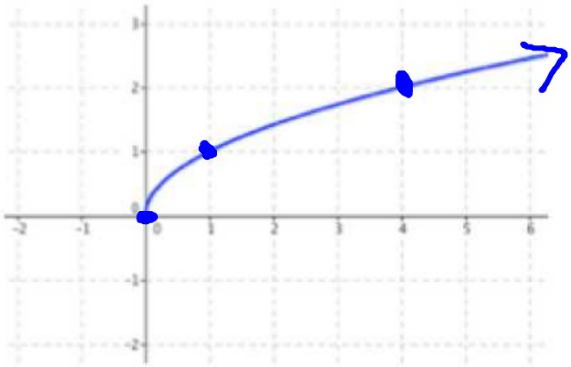
A2: Graphs of Square Root & Cube Root Functions

HW:

Square Root Graphs

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

Graph:



x	y
0	0
1	1
4	2

Domain: $\{x \mid x \geq 0\}$ $[0, \infty)$

Range: $\{y \mid y \geq 0\}$ $(0, \infty)$

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

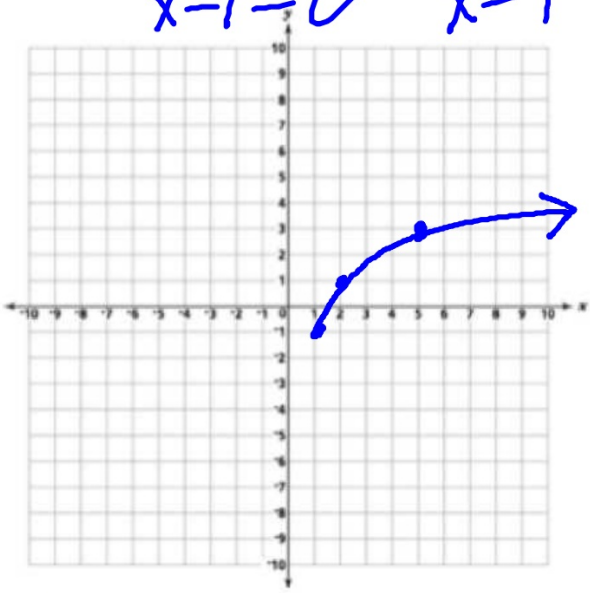
a) $y = 2\sqrt{x-1} - 1$

radicand = 0

$x - 1 = 0$ $x = 1$

x	y
1	−1
2	1
5	3

key point



Domain: $[1, \infty)$	Range: $[-1, \infty)$

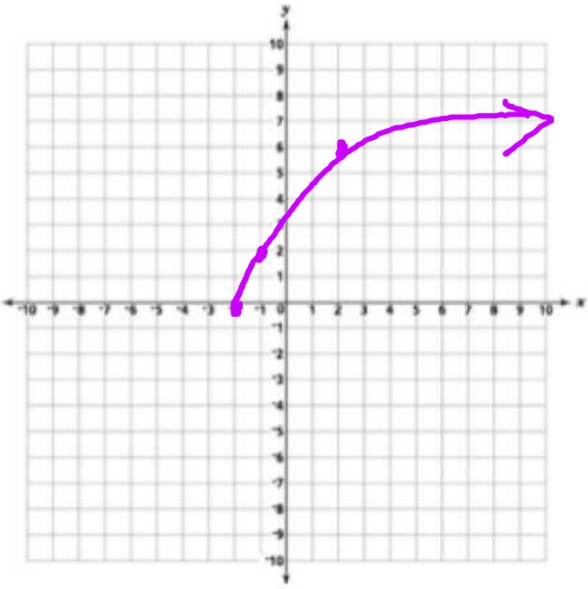
ex: Sketch and state the domain and range in interval notation.

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

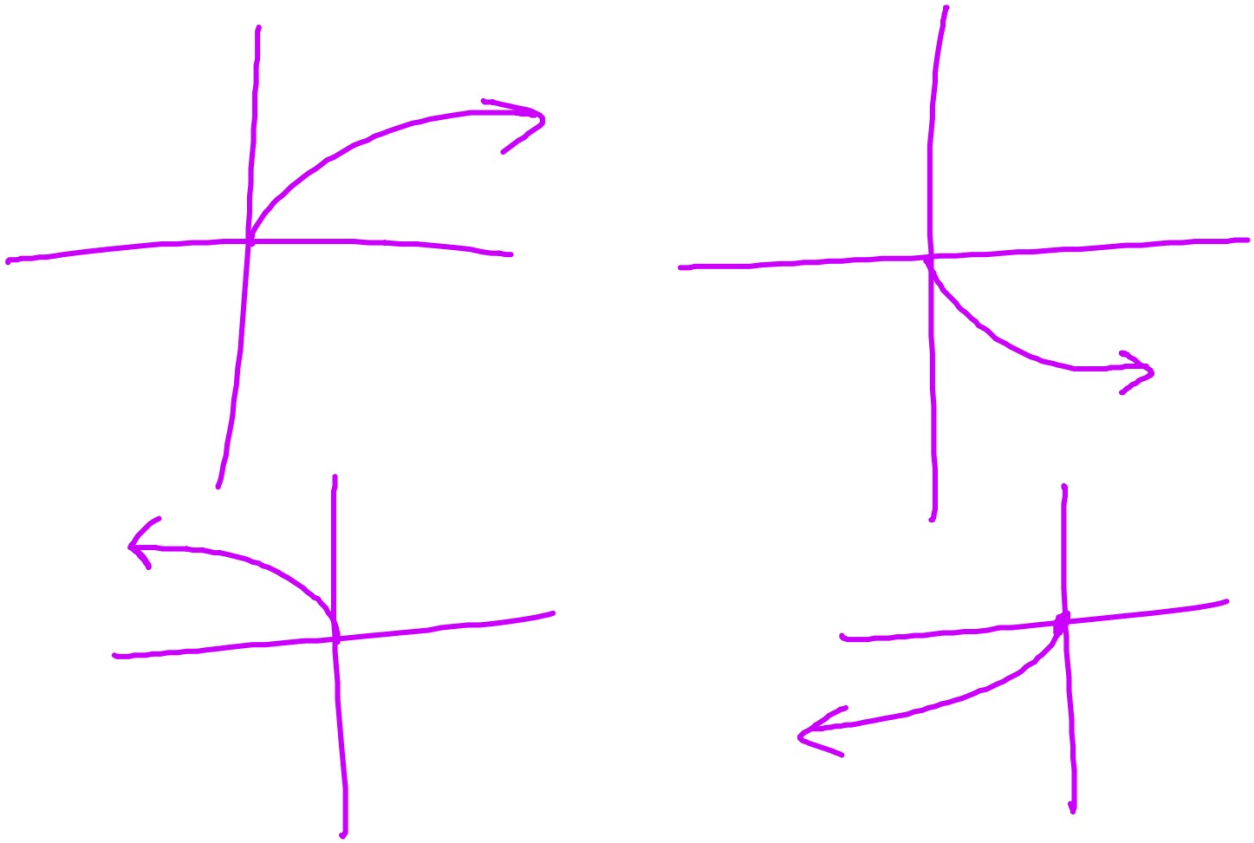
x	y
-2	0
-1	3
2	6

$x+2=1$
$x=-1$

$x+2=4$
$x=2$



Domain: $[-2,\infty)$	Range: $[0,\infty)$

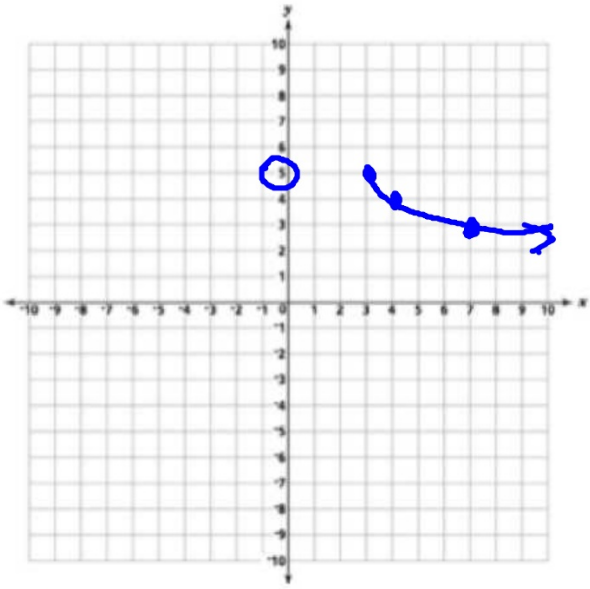


ex: Sketch and state the domain and range in interval notation.

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

x	y
3	5
4	4
7	3

$x - 3 = 4$



Domain: $[3, \infty)$	Range: $(-\infty, 5]$

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

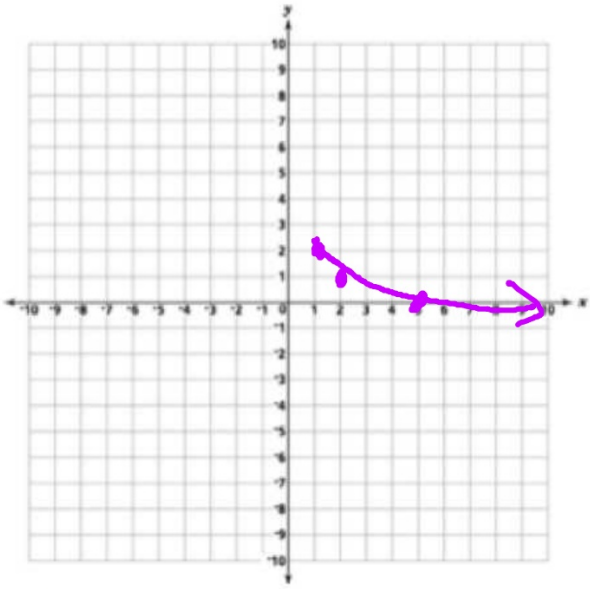
d) $y = \cancel{2 - \sqrt{1 - x}}$

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

x	y
1	2
2	1
5	0

$x - 1 = 1$
$x = 2$

$x - 1 = 4$
$x = 5$



Domain: $[1, \infty)$	Range: $(-\infty, 2]$

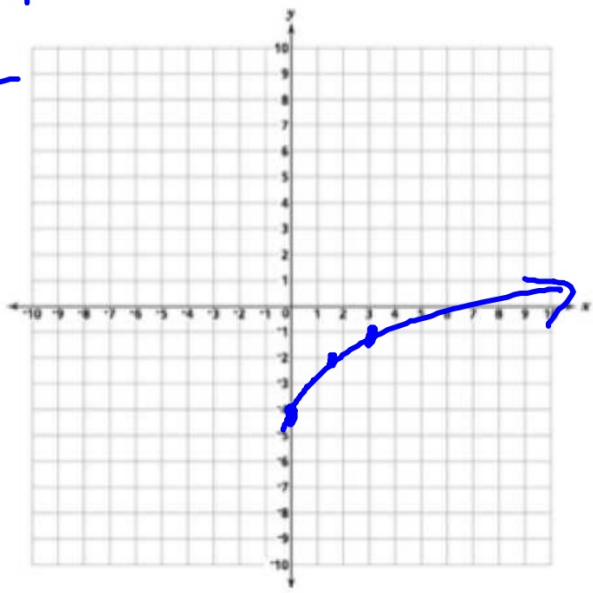
ex: Sketch and state the domain and range in interval notation.

e) $y = \sqrt{3x} - 4$

$3x = 4$

$x = \frac{4}{3}$

x	y
0	-4
3	-1
4/3	-2

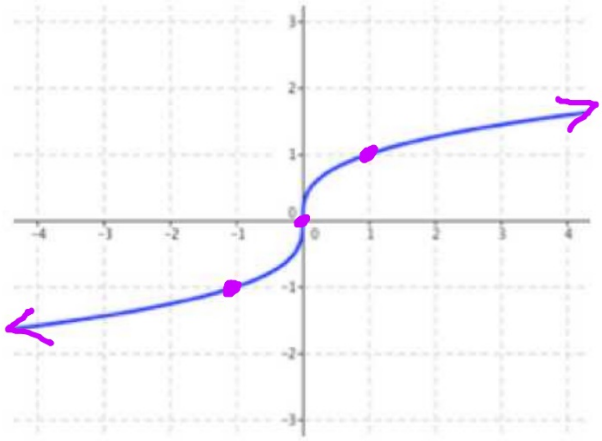


Domain: $[0, \infty)$	Range: $[-4, \infty)$

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.

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

$\sqrt[3]{-8} + 5$

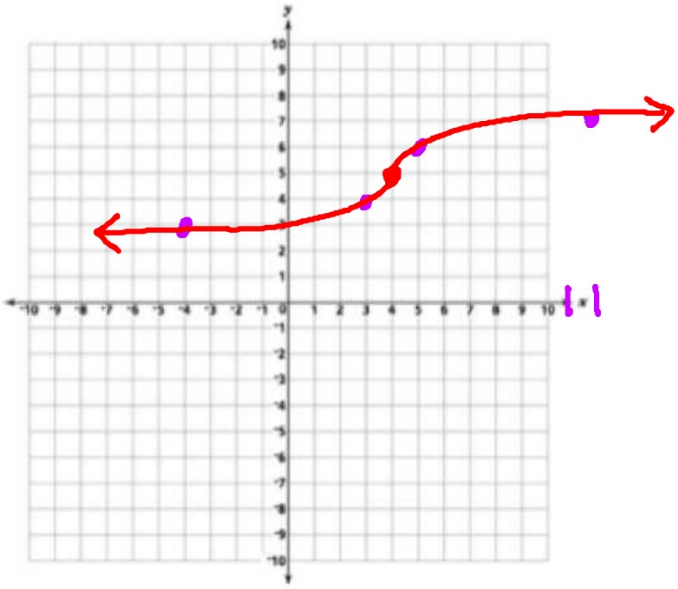
x	y
-4	3
3	4
4	5
5	6
12	7

$x - 4 = 1$
$x = 5$

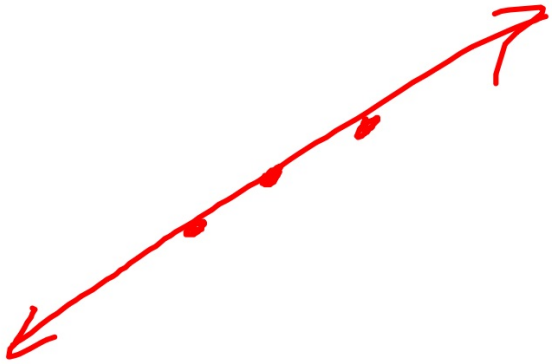
$x - 4 = -1$
$x = 3$

$x - 4 = 8$
$x = 12$

$x - 4 = -8$
$x = -4$



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

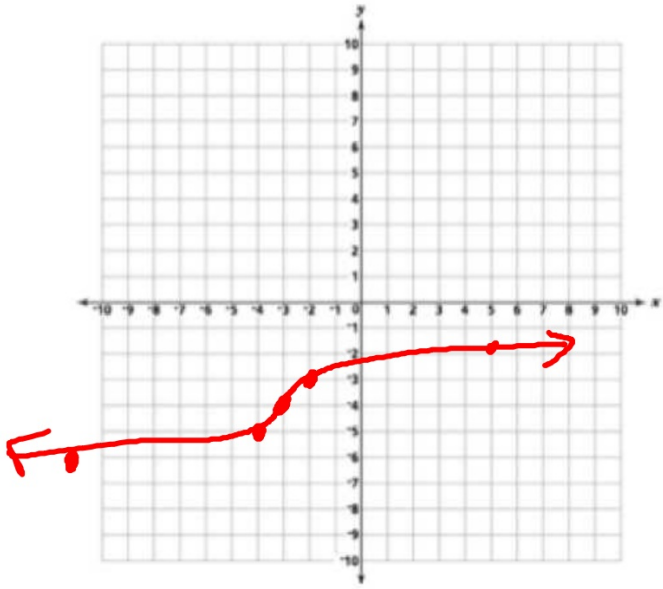


ex: Sketch and state the domain and range in interval notation.

$-1, 1, 8, -8$

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

x	y
-11	-6
-4	-5
-3	-4
-2	-3
5	-2

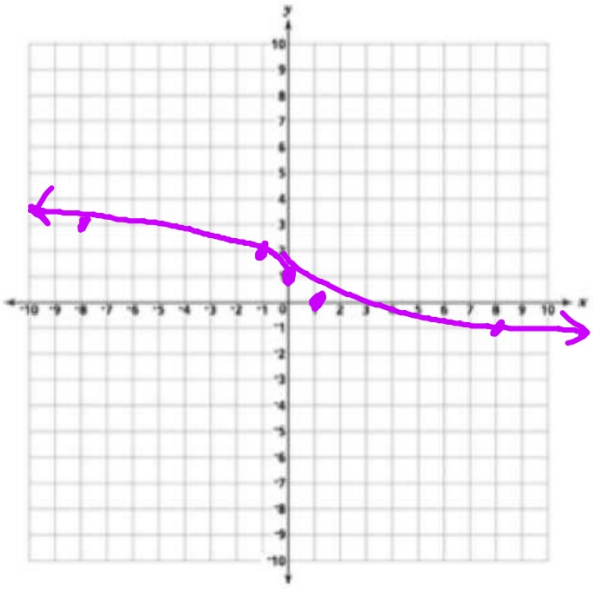


Domain:	Range:

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

c) $y = -\sqrt[3]{x} + 1$

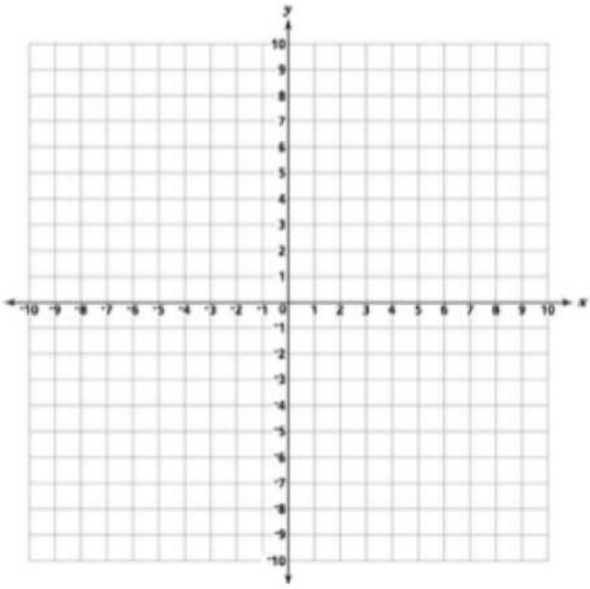
x	y
-8	3
-1	2
0	1
1	0
8	-1



Domain:	Range:

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

d) $y = \sqrt[3]{\frac{x}{2}}$



Domain:	Range:

REVIEW

ex: Simplify.

$$\sqrt[6]{128x^6y^{13}z^9}$$