

Algebra II

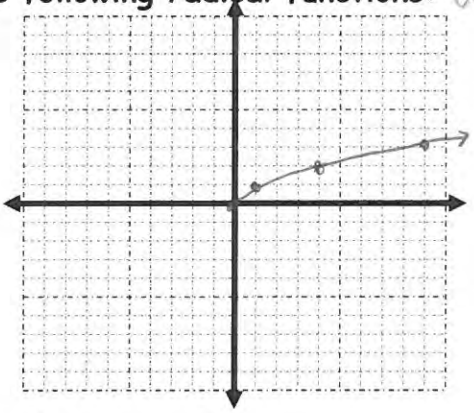
5.3 Graph radical functions

Obj: Graph and transform radical functions

looks like half parabola sideways

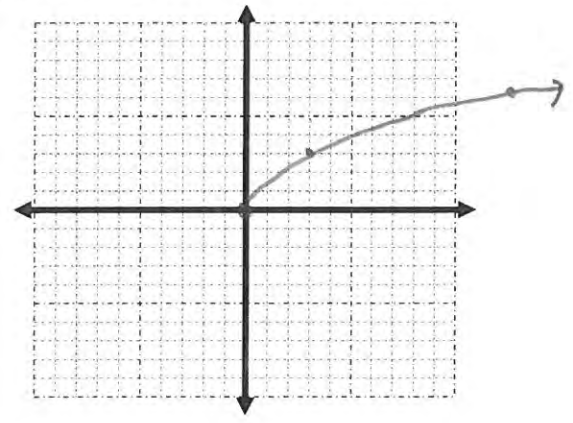
Graph the following radical functions: why?

x	y
0	0
1	1
4	2
9	3



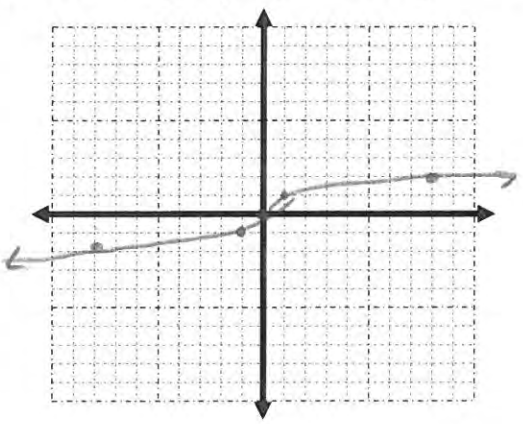
$y = \sqrt{x}$
 ↑ can't be negative
 Domain: $[0, \infty)$ Range $[0, \infty)$

x	y
0	0
3	3
12	6
27	9



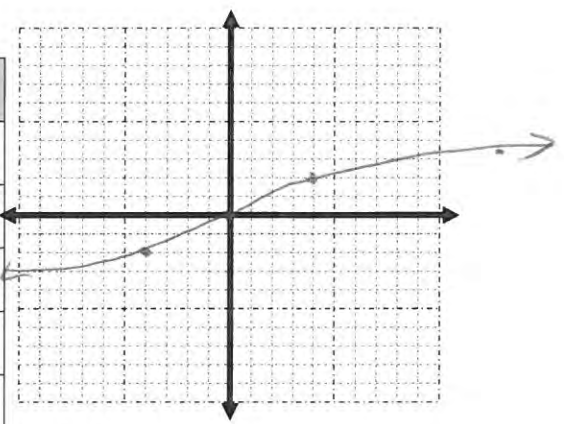
$y = \sqrt{3x}$

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



$y = \sqrt[3]{x}$
 D: $(-\infty, \infty)$ R: $(-\infty, \infty)$
 no domain restrictions

x	y
-13.5	-3
-4	-2
0	0
4	2
13.5	3



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

GRAPHS OF RADICAL FUNCTIONS

To graph $y = a\sqrt{x-h} + k$ or $y = a\sqrt[3]{x-h} + k$, follow these steps

- A: stretch $a < 0$ reflects
- H: horizontal shift (opp. direction)
- K: vertical shift

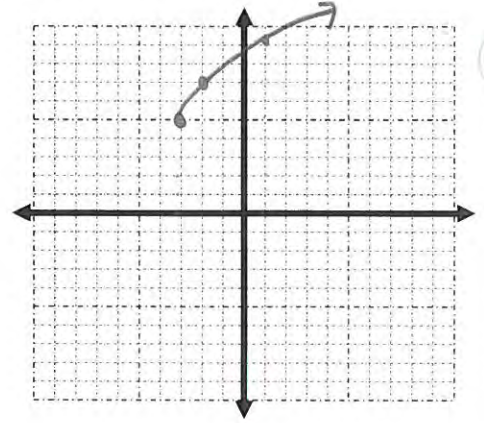
Example 2 Graph. $2\sqrt{x+3}+5$ left 3 up 5 defines domain+range For $\sqrt{\quad}$

Describe the transformations and find the domain and range.

x	y
-3	5
-2	7
1	9

$(-3, 5)$
choose x so you can $\sqrt{\quad}$

D: $[-3, \infty)$ R: $[5, \infty)$

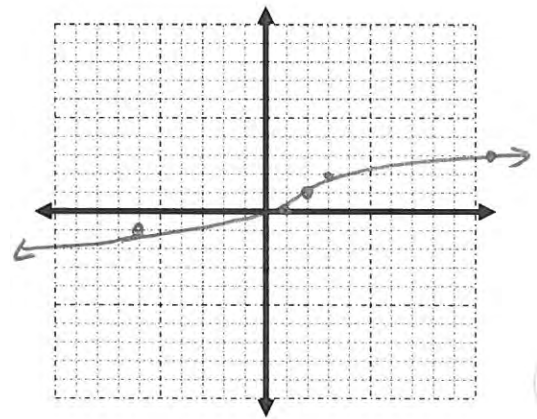


You try. $y = \sqrt[3]{x-2}+1$ rt 2, 1

x	y
2	1
3	2
1	0
10	3
-6	-1

choose x so you can $\sqrt[3]{\quad}$

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

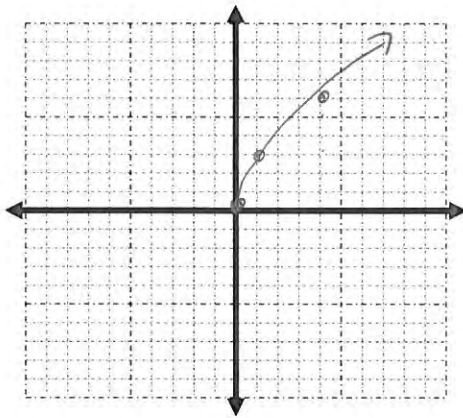


Example #3: rewrite to graph. State the Domain and Range.

left 4 up 7

a) Graph $y = \sqrt{9x} = 3\sqrt{x}$

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

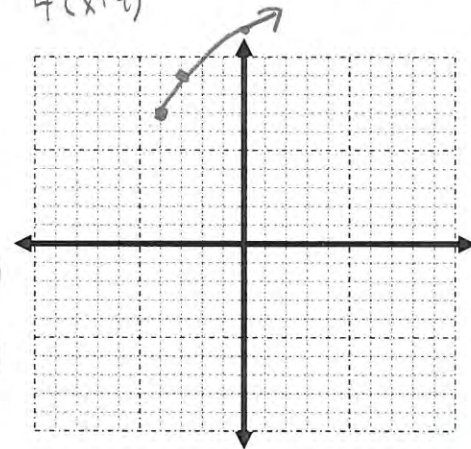


x	y
0	0
1	3
4	6

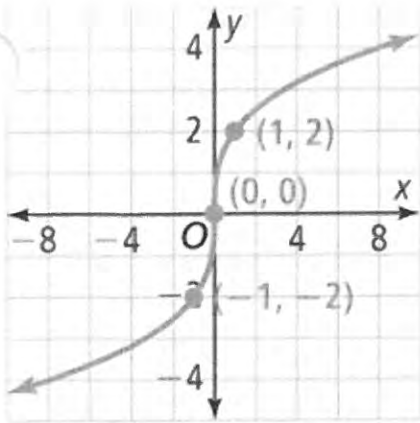
b) $y = \sqrt{4x+16}+7 = 2\sqrt{x+4}+7$
 $4(x+4)$

x	y
-4	7
-3	9
0	11

D: $[-4, \infty)$
R: $[7, \infty)$



Example #4: Write an equation of a transformation.



$$y = a\sqrt[3]{x}$$

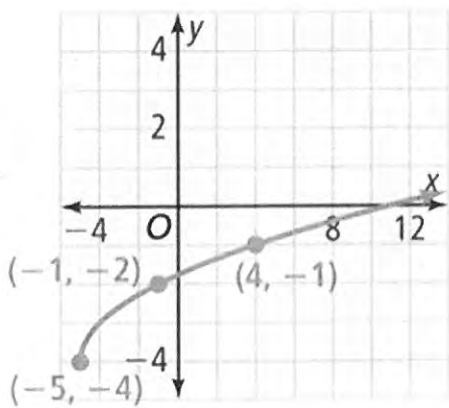
$$2 = a\sqrt[3]{1}$$

$$2 = a$$

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

You try.

a.



$$y = a\sqrt{x+5} - 4$$

$$-2 = a\sqrt{-1+5} - 4$$

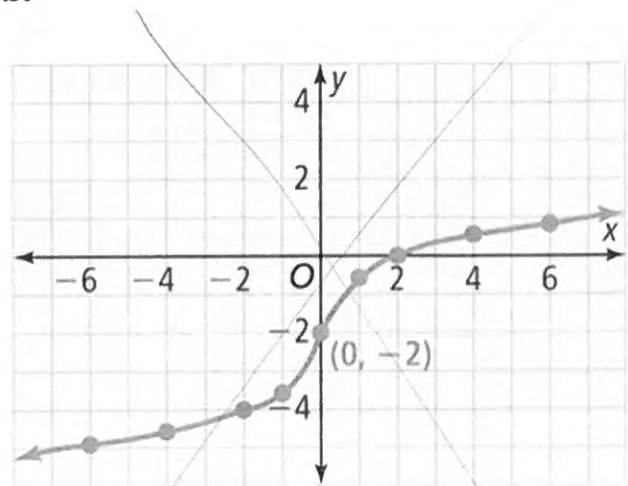
$$-2 = 2a - 4$$

$$2 = 2a$$

$$1 = a$$

$$y = \sqrt{x+5} - 4$$

b.



$$y = a\sqrt[3]{x} - 2$$

$$(2, 0)$$

$$0 = a\sqrt[3]{2} - 2$$

$$2 = a\sqrt[3]{2}$$

$$\frac{2}{\sqrt[3]{2}} = a$$

