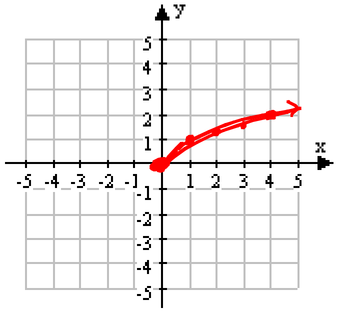
Name:

Consider the following EQUATIONS, make a table, plot the points, and graph what you think the graph looks like.

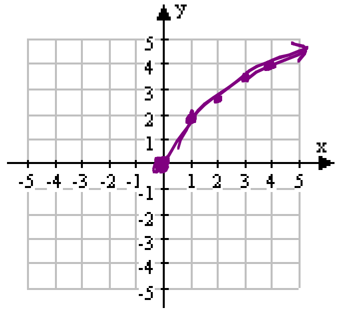
1. $f(x)=\sqrt{x}$

x	y
~~– 4~~	$\cancel{\sqrt{-4}=2i}$
~~– 1~~	$\cancel{\sqrt{-1}=i}$
0	$\sqrt{0}=0$
1	$\sqrt{1}=1$
2	$\sqrt{2}\approx 1.41$
3	$\sqrt{3}\approx 1.73$
4	$\sqrt{4}=2$



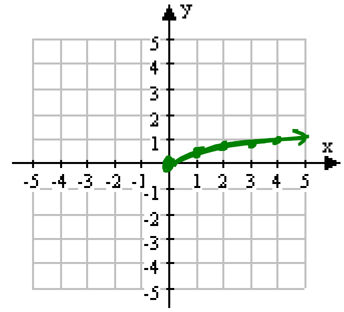
2. $f(x)=2\sqrt{x}$

x	y
~~– 4~~	$\cancel{2\sqrt{-4}=2\cdot 2i=4i}$
~~– 1~~	$\cancel{2\sqrt{-1}=2i}$
0	$2\sqrt{0}=2\cdot 0=0$
1	$2\sqrt{1}=2\cdot 1=2$
2	$2\sqrt{2}\approx 2.83$
3	$2\sqrt{3}\approx 3.46$
4	$2\sqrt{4}=2\cdot 2=4$



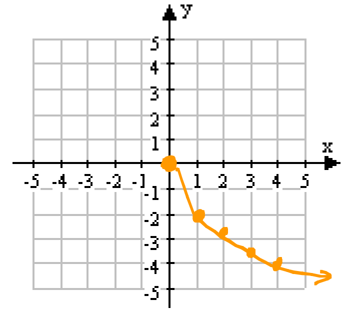
3. $f(x)=0.5\sqrt{x}$

x	y
~~– 4~~	$\cancel{0.5\sqrt{-4}=0.5\cdot 2i=i}$
~~– 1~~	$\cancel{0.5\sqrt{-1}=0.5i}$
0	$0.5\sqrt{0}=0.5(0)=0$
1	$0.5\sqrt{1}=0.5(1)=0.5$
2	$0.5\sqrt{2}\approx 0.71$
3	$0.5\sqrt{3}\approx 0.87$
4	$0.5\sqrt{4}=0.5(2)=1$



4. $f(x)=-2\sqrt{x}$

x	y
~~– 4~~	$\cancel{2\sqrt{-4}=-2(2i)=-4i}$
~~– 1~~	$\cancel{2\sqrt{-1}=-2i}$
0	$-2\sqrt{0}=-2(0)=0$
1	$-2\sqrt{1}=-2(1)=-2$
2	$-2\sqrt{2}\approx -2.83$
3	$-2\sqrt{3}\approx -3.46$
4	$-2\sqrt{4}=-2(2)=-4$



5. What happens to the graph as the number in front of $\sqrt{x}$ gets Larger? Close to Zero? Negative?

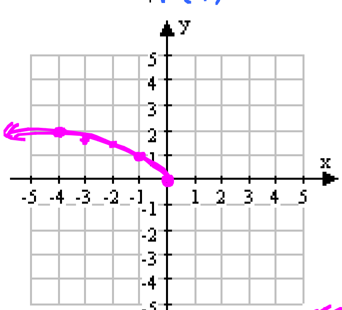
AS THE COEFFICIENT OF THE $\sqrt{x}$ GETS LARGER THE GRAPH BECOMES VERTICALLY STRETCHED.

AS THE COEFFICIENT OF THE $\sqrt{x}$ GETS CLOSER TO ZERO THE GRAPH BECOMES VERTICALLY COMPRESSED

WHEN THE COEFFICIENT OF $\sqrt{x}$ IS NEGATIVE THE GRAPH IS FLIPPED OR REFLECTED OVER THE X-AXIS.

6. $f(x)=\sqrt{-x}$

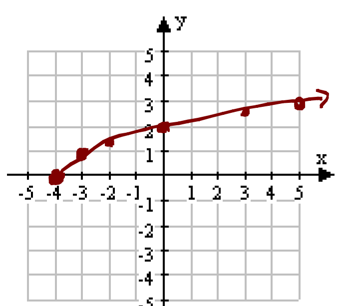
x	y
– 4	$\sqrt{-(-4)}=\sqrt{4}=2$
– 3	$\sqrt{-(-3)}=\sqrt{3}\approx 1.73$
– 2	$\sqrt{-(-2)}=\sqrt{2}\approx 1.41$
– 1	$\sqrt{-(-1)}=\sqrt{1}=1$
0	$\sqrt{-(0)}=\sqrt{0}=0$
~~1~~	$\cancel{\sqrt{-(1)}=i}$
~~4~~	$\cancel{\sqrt{-(4)}=2i}$



REFLECT OVER Y-AXIS

7. $f(x)=\sqrt{x+4}$

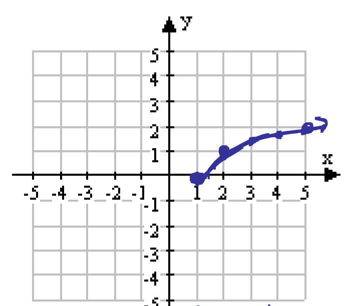
x	y
~~– 5~~	$\cancel{\sqrt{-5+4}=\sqrt{-1}=i}$
– 4	$\sqrt{-4+4}=\sqrt{0}=0$
– 3	$\sqrt{-3+4}=\sqrt{1}=1$
– 2	$\sqrt{-2+4}=\sqrt{2}\approx 1.41$
0	$\sqrt{0+4}=\sqrt{4}=2$
3	$\sqrt{3+4}=\sqrt{7}\approx 2.65$
5	$\sqrt{5+4}=\sqrt{9}=3$



LEFT 4

8. $f(x)=\sqrt{x-1}$

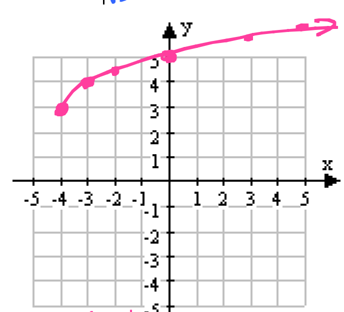
x	y
~~– 3~~	$\cancel{\sqrt{-3-1}=\sqrt{-4}=2i}$
~~0~~	$\cancel{\sqrt{0-1}=\sqrt{-1}=i}$
1	$\sqrt{1-1}=\sqrt{0}=0$
2	$\sqrt{2-1}=\sqrt{1}=1$
3	$\sqrt{3-1}=\sqrt{2}\approx 1.41$
4	$\sqrt{4-1}=\sqrt{3}\approx 1.73$
5	$\sqrt{5-1}=\sqrt{4}=2$



RIGHT 1

9. $f(x)=\sqrt{x+4}+3$

x	y
~~– 5~~	$\cancel{\sqrt{-5+4}+3=3+i}$
– 4	$\sqrt{-4+4}+3=3$
– 3	$\sqrt{-3+4}+3=4$
– 2	$\sqrt{-2+4}+3\approx 4.41$
0	$\sqrt{0+4}+3=5$
3	$\sqrt{3+4}+3\approx 5.65$
5	$\sqrt{5+4}+3=6$



LEFT 4 UP 3

10. What happens to the graph as we add or subtract a number inside or outside the radical?

WHEN WE ADDED A NUMBER TO X INSIDE THE RADICAL THE GRAPH MOVED LEFT.

WHEN WE SUBTRACTED FROM X INSIDE THE RADICAL THE GRAPH MOVED RIGHT.

WHEN WE ADDED A NUMBER TO THE OUTSIDE OF THE RADICAL THE GRAPH MOVED UP AND WOULD MOVE DOWN IF WE HAD SUBTRACTED

Consider the following EQUATIONS, make a table, plot the points, and graph what you think the graph looks like.

11. $f(x)=\sqrt[3]{x}$

x	y
– 8	$\sqrt[3]{-8} = -2$
– 4	$\sqrt[3]{-4} \approx -1.59$
– 1	$\sqrt[3]{-1} = -1$
0	$\sqrt[3]{0} = 0$
1	$\sqrt[3]{1} = 1$
4	$\sqrt[3]{4} \approx 1.59$
8	$\sqrt[3]{8} = 2$

12. $f(x)=3\sqrt[3]{x}$

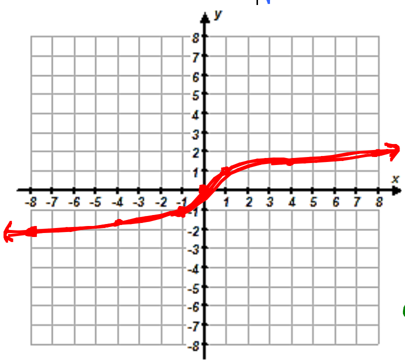
x	y
– 8	$3\sqrt[3]{-8} = -6$
– 4	$3\sqrt[3]{-4} \approx -4.76$
– 1	$3\sqrt[3]{-1} = -3$
0	$3\sqrt[3]{0} = 0$
1	$3\sqrt[3]{1} = 3$
4	$3\sqrt[3]{4} \approx 4.76$
8	$3\sqrt[3]{8} = 6$

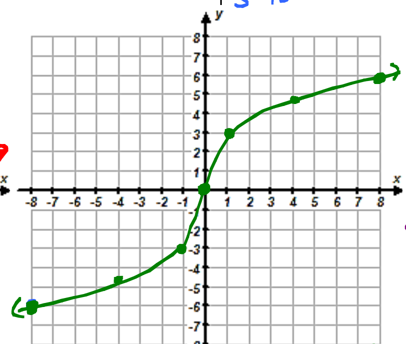
13. $f(x)=\sqrt[3]{x+3}$

x	y
– 8	$\sqrt[3]{-8+3} \approx -1.71$
– 4	$\sqrt[3]{-4+3} = -1$
– 3	$\sqrt[3]{-3+3} = 0$
– 2	$\sqrt[3]{-2+3} = 1$
1	$\sqrt[3]{1+3} \approx 1.59$
5	$\sqrt[3]{5+3} = 2$
8	$\sqrt[3]{8+3} \approx 2.22$

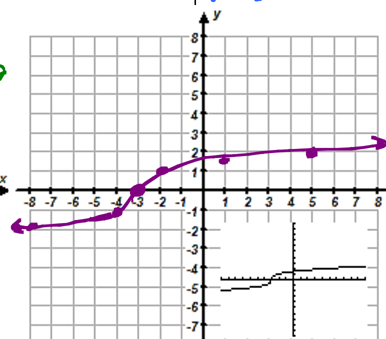
14. $f(x)=\sqrt[3]{x+3}+4$

x	y
– 8	$\sqrt[3]{-8+3}+4 \approx 2.29$
– 4	$\sqrt[3]{-4+3}+4 = 3$
– 3	$\sqrt[3]{-3+3}+4 = 4$
– 2	$\sqrt[3]{-2+3}+4 = 5$
1	$\sqrt[3]{1+3}+4 \approx 5.59$
5	$\sqrt[3]{5+3}+4 = 6$
8	$\sqrt[3]{8+3}+4 \approx 6.22$

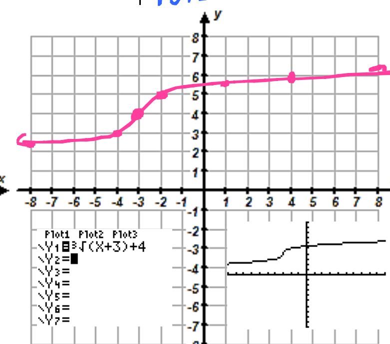




VERTICAL STRETCH



LEFT 3



LEFT 3 UP 4

15. Sketch a graph of $f(x)=2\sqrt{x+3}-4$ and answer the following questions.

a. Explain the transformations of the parent function $p(x)=\sqrt{x}$ to create $f(x)$.

VERTICAL STRETCH FACTOR 2

LEFT 3, DOWN 4

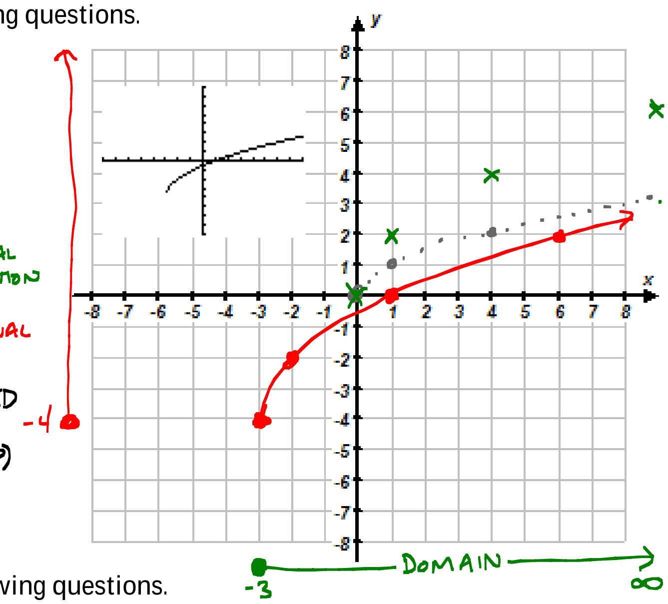
b. Domain of *f(x)*: $x \geq -3$ SET NOTATION $[-3,\infty)$ INTERVAL NOTATION

c. Range of *f(x)*: $y \geq -4$: SET $[-4,\infty)$: INTERVAL

d. End Behavior of *f(x)*: AS $x \to -\infty$ (LEFT) $f(x) \to$ UNDEFINED

AS $x \to \infty$ (RIGHT) $f(x) \to \infty$ (UP)

e. Extrema: A MINIMUM AT $(-3,-4)$



16. Sketch a graph of $g(x)=-3\cdot\sqrt[3]{x+4}+2$ and answer the following questions.

a. Explain the transformations of the parent function $p(x)=\sqrt[3]{x}$ to create $g(x)$.

- REFLECT OVER X-AXIS & VERTICAL STRETCH FACTOR 3
- LEFT 4
- UP 2

b. Domain of *f(x)*: ALL REALS ($\mathbb{R}$) $(-\infty,\infty)$

c. Range of *f(x)*: ALL REALS ($\mathbb{R}$) $(-\infty,\infty)$

d. End Behavior of *f(x)*: AS $x \to -\infty$ (LEFT), $g(x) \to \infty$ (UP)

AS $x \to \infty$ (RIGHT), $g(x) \to -\infty$ (DOWN)