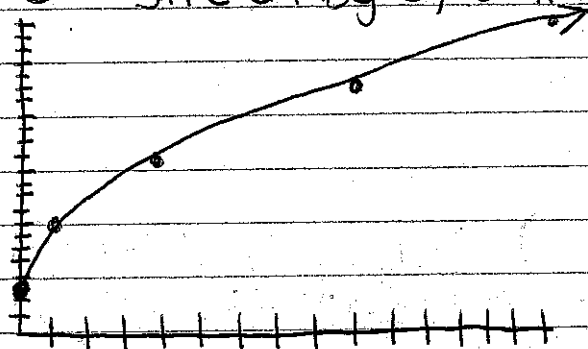


Graphing Radicals WS

1) $y = 5\sqrt{x} + 3$ stretch by 5, shift up 3

x	y
0	3
1	8
4	13
9	18
16	23



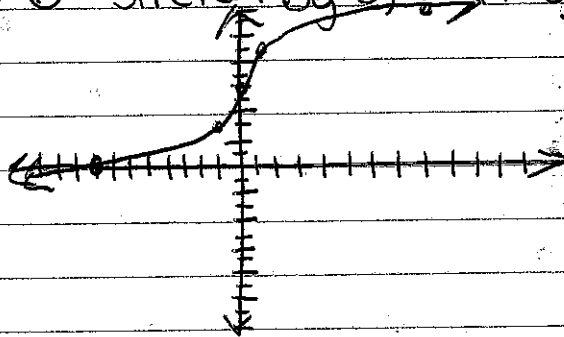
V: $(0, 3)$ D: $[0, \infty)$ R: $[3, \infty)$ min: $(0, 3)$

Inc: $(0, \infty)$ End: As $x \rightarrow \infty, y \rightarrow \infty$

x-int: none y-int: $(0, 3)$

2) $y = 3\sqrt[3]{x} + 6$ stretch by 3, shift up 6

x	y
-8	0
-1	3
0	6
1	9
8	12



V: $(0, 6)$ D: \mathbb{R} R: \mathbb{R} NO max/min

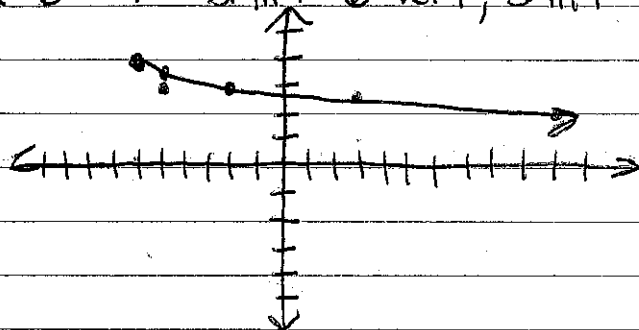
Inc: $(-\infty, \infty)$ End: As $x \rightarrow -\infty, y \rightarrow -\infty$

x-int: $(-8, 0)$ AS $x \rightarrow \infty, y \rightarrow \infty$

y-int: $(0, 6)$

3) $y = -\frac{1}{2}\sqrt{x+6} + 4$ reflect over x-axis, shrink by $\frac{1}{2}$
 shift 6 left, shift 4 up

x	y
-6	4
-5	3.5
-2	3
3	2.5
10	2



V: $(-6, 4)$ D: $[-6, \infty)$ R: $(-\infty, 4]$ max: $(-6, 4)$

Dec: $(-6, \infty)$ End: As $x \rightarrow \infty, y \rightarrow -\infty$

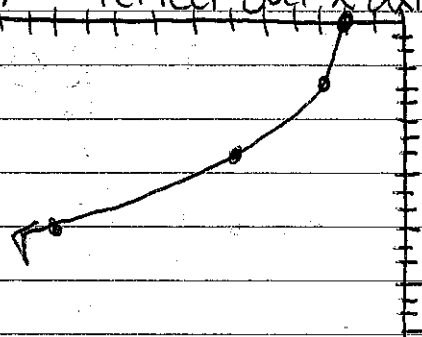
X-int: $0 = -\frac{1}{2}\sqrt{x+6} + 4$ $8 = \sqrt{x+6}$ $(58, 0)$

$-4 = -\frac{1}{2}\sqrt{x+6}$ $64 = x+6$

Y-int: ~~$(0, 4)$~~ $(0, 4 - \frac{\sqrt{6}}{2})$

4) $y = -4\sqrt{-(x+2)}$ shift 2 left, reflect over y-axis
 reflect over x-axis, stretch by 4

x	y
-2	0
-3	-4
-6	-8
-11	-12
-18	-16



V: $(-2, 0)$ D: $(-\infty, -2]$ R: $(-\infty, 0]$ max: $(-2, 0)$

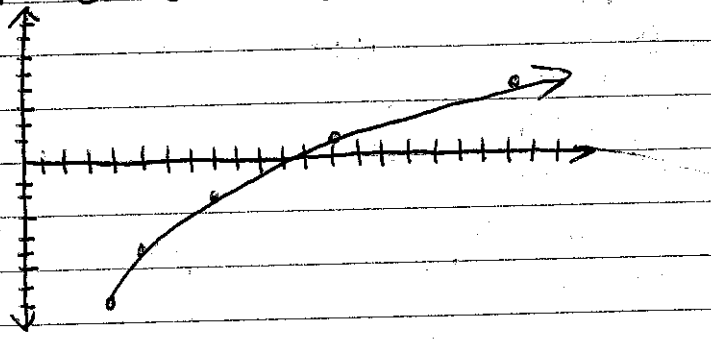
Inc: $(-\infty, -2]$ End: As $x \rightarrow -\infty, y \rightarrow -\infty$

X-int: $(-2, 0)$ Y-int: none

c by $\frac{1}{2}$
→

5. $y = 3\sqrt{x-4} - 8$ shift right 4, stretch by 3
shift down 8

x	y
4	-8
5	-5
8	-2
13	1
20	4



4)

V: (4, -8) D: [4, ∞) R: [-8, ∞) min: (4, -8)

Inc: [4, ∞) End: As $x \rightarrow \infty$, $y \rightarrow \infty$

X-int: $0 = 3\sqrt{x-4} - 8$ $\frac{8}{3} = \sqrt{x-4}$ ~~(100, 0)~~
 $8 = 3\sqrt{x-4}$ $\frac{64}{9} = x-4$ ~~(100, 0)~~

Y-int: none

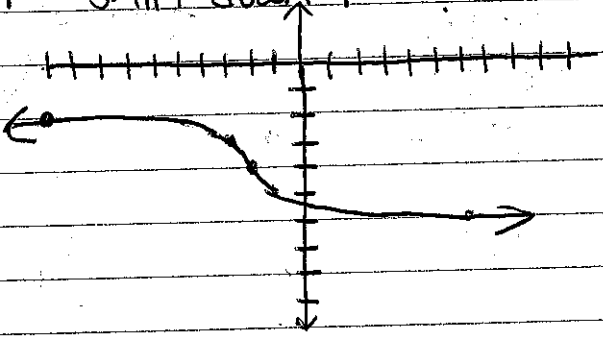
axis

by 4
15

shift left 2, reflect over x-axis

6. $y = -\sqrt[3]{x+2} - 4$ shift down 4

x	y
-6	-2
-3	-3
-2	-4
-1	-5
6	-6



0)

V: (-2, -4) D: ℝ R: ℝ min/max: none

Dec: (-∞, ∞) End: As $x \rightarrow -\infty$, $y \rightarrow \infty$
As $x \rightarrow \infty$, $y \rightarrow -\infty$

X-int: $0 = -\sqrt[3]{x+2} - 4$ (-66, 0)

$4 = -\sqrt[3]{x+2}$

$-4 = \sqrt[3]{x+2}$

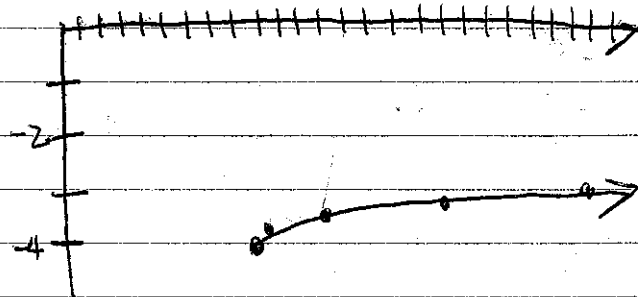
$-64 = x+2$

Y-int: $-\sqrt[3]{0+2} - 4$

~~(0, -4)~~ (0, $-4 - \sqrt[3]{2}$)

7. $y = \frac{1}{4}\sqrt{x-9} - 4$ shift right 9
 shrink by $\frac{1}{4}$, shift down 4

x	y
9	-4
10	-3.75
13	-3.5
18	-3.25
25	-3



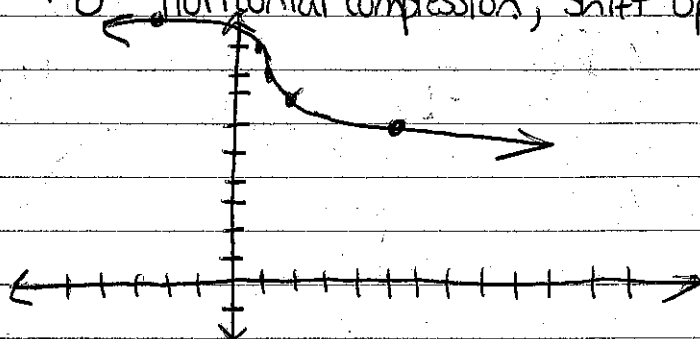
V: (9, -4) D: [9, ∞) R: [-4, ∞) min: (9, -4)

Inc: (9, ∞) End: AS $x \rightarrow \infty$, $y \rightarrow \infty$

X-int: $0 = \frac{1}{4}\sqrt{x-9} - 4$ $256 = x-9$ Y-int: none
 $4 = \frac{1}{4}\sqrt{x-9}$ $265 = x$
 $16 = \sqrt{x-9}$ $(265, 0)$

8. $y = \sqrt[3]{-2(x-1)} + 8$ shift right 1, reflect over y-axis,
 horizontal compression, shift up 8

x	y
5	6
1.5	7
1	8
.5	9
-3	10



V: (1, 8) D: R R: R max/min: none

Dec: (-∞, ∞) End: AS $x \rightarrow -\infty$, $y \rightarrow \infty$

X-int: $0 = \sqrt[3]{-2(x-1)} + 8$ AS $x \rightarrow \infty$, $y \rightarrow -\infty$

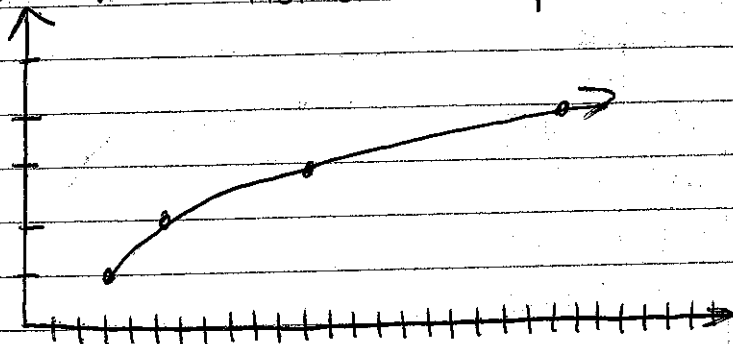
$-8 = \sqrt[3]{-2(x-1)}$ $256 = x-1$

$-512 = -2(x-1)$ $(257, 0)$

Y-int: ~~(0, 9)~~ ~~(0, 10)~~ $(0, 8 + \sqrt[3]{2})$

9. $y = \sqrt{\frac{1}{2}(x-3)} + 1$ shift right 3, shift up 1
horizontal expansion by 2

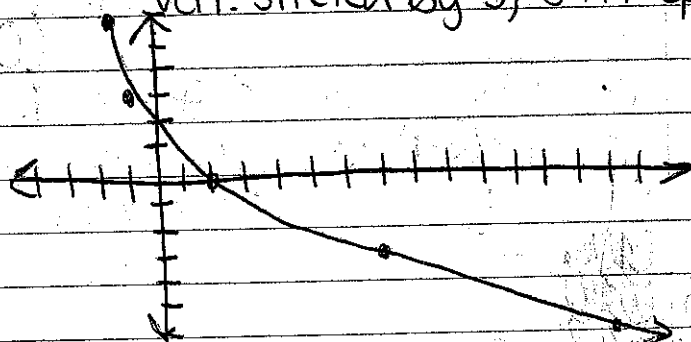
x	y
3	1
5	2
11	3
21	4
35	5



V: (3, 1) D: [3, ∞) R: [1, ∞) min: (3, 1)
Inc: (3, ∞) End: As $x \rightarrow \infty, y \rightarrow \infty$
X-int: none Y-int: none

10. $y = -3\sqrt{x+2} + 6$ shift left 2, reflect over x-axis,
vert. stretch by 3, shift up 6

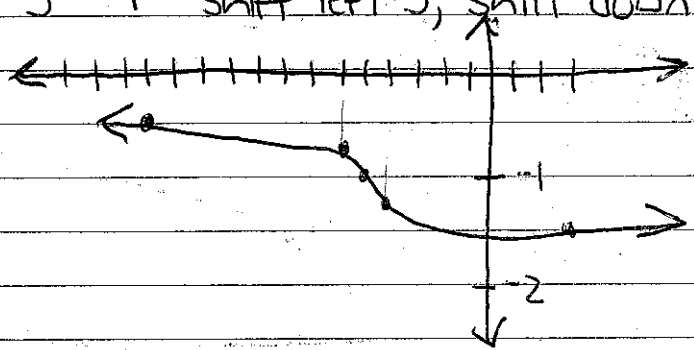
x	y
-2	6
-1	3
2	0
7	-3
14	-6



V: (-2, 6) D: [-2, ∞) R: (-∞, 6] max: (-2, 6)
Dec: [-2, ∞) End: As $x \rightarrow \infty, y \rightarrow -\infty$
X-int: (2, 0)
Y-int: ~~(0, 6)~~ (0, $6 - 3\sqrt{2}$)

11. $y = -\frac{1}{4}\sqrt[3]{x+5} - 1$ reflect over x-axis, shrink by $\frac{1}{4}$, shift left 5, shift down 1

x	y
-13	-5
-6	-7.5
-5	-1
-4	-1.25
3	-1.5



V: $(-5, -1)$ D: \mathbb{R} R: \mathbb{R} max/min: none
 Dec: $(-\infty, \infty)$ End: As $x \rightarrow -\infty, y \rightarrow \infty$

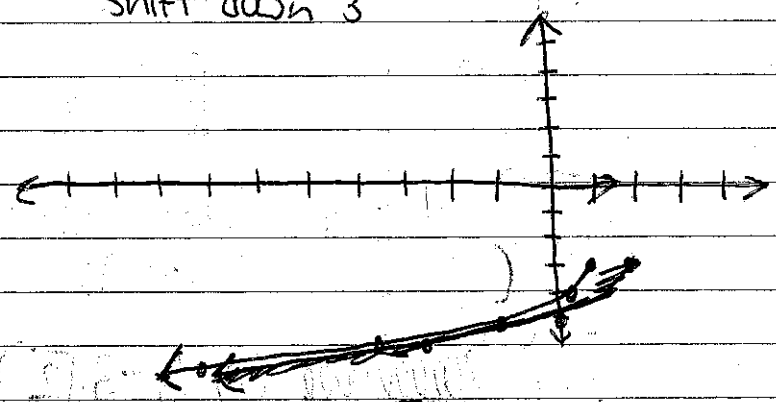
X-int: $0 = -\frac{1}{4}\sqrt[3]{x+5} - 1$ As $x \rightarrow \infty, y \rightarrow -\infty$
 $1 = -\frac{1}{4}\sqrt[3]{x+5}$

$-4 = \sqrt[3]{x+5}$ ~~$(-64, 0)$~~ $(-69, 0)$

$-64 = x+5$ Y-int: ~~$(0, -1)$~~ $(0, -1 - \frac{\sqrt[3]{5}}{4})$

12. $y = -\sqrt{-2x+2} - 3$ shift right 1, reflect over y-axis,
 $y = -\sqrt{2(x-1)} - 3$ h. compression by 2, reflect over x-axis,
 shift down 3

x	y
1	-3
.5	-4
-1	-5
-3.5	-6
-7	-7



V: $(1, -3)$ D: $(-\infty, 1]$ R: $(-\infty, -3]$ max: $(1, -3)$

Inc: $(-\infty, 1]$ End: As $x \rightarrow -\infty, y \rightarrow -\infty$

X-int: none Y-int: ~~$(0, -3)$~~ $(0, -3 - \sqrt{2})$