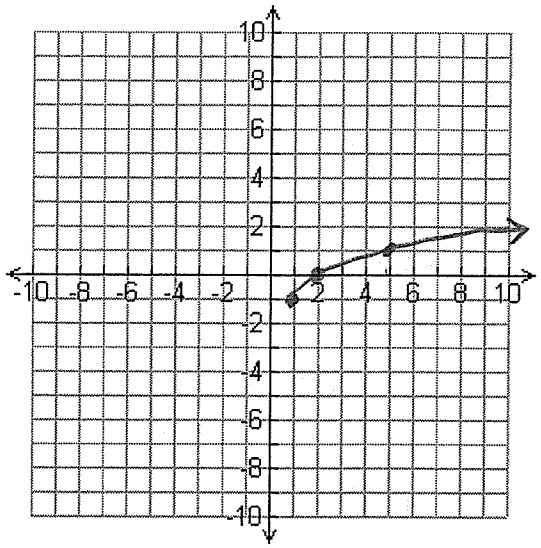
Graph the following. State the domain and range. Let $g(x)$ be the parent function. Describe the transformation(s) that $g(x)$ underwent to be $f(x)$.

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

inside, outside

x	y
1	-1
2	0
5	1



D: $\{x \geq 1\}$

R: $\{y \geq -1\}$

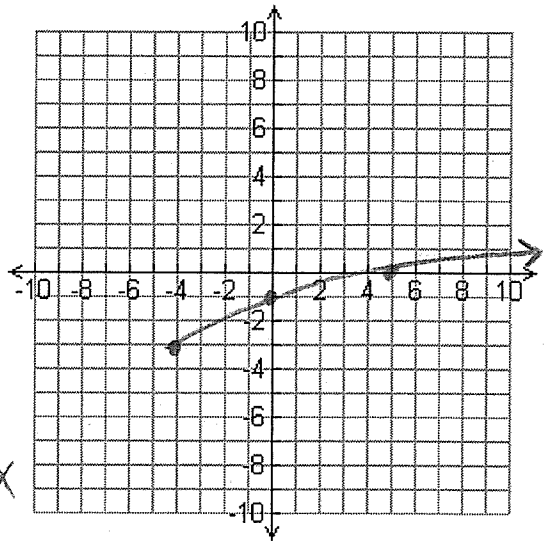
(1) horizontal translation right 1X

(2) vertical translatin down 1X

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

inside, outside ↓

x	y
-4	-3
0	-1
5	0



D: $\{x \geq -4\}$

R: $\{y \geq -3\}$

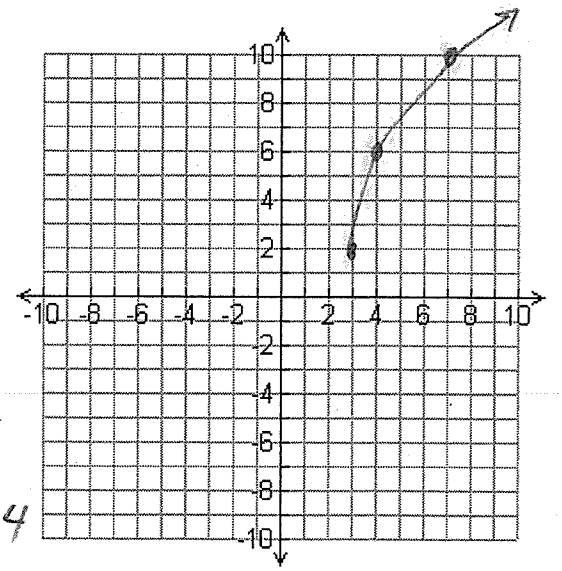
(1) vertical translatin down 3X

(2) horizontal translatin left 4X

3) $f(x) = 4\sqrt{x-3} + 2$ ← outside (vertical)

outside (vertical), inside

x	y
3	2
4	6
7	10



D: $\{x \geq 3\}$

R: $\{y \geq 2\}$

(1) Horiz. translatin 3 x right

(2) Vertical stretch by factor of 4

(3) Vertical translate 2x up.

Graphing: Graph each of the following irrational functions along with its parent graph.

1. $y = 2\sqrt{x+1}+4$

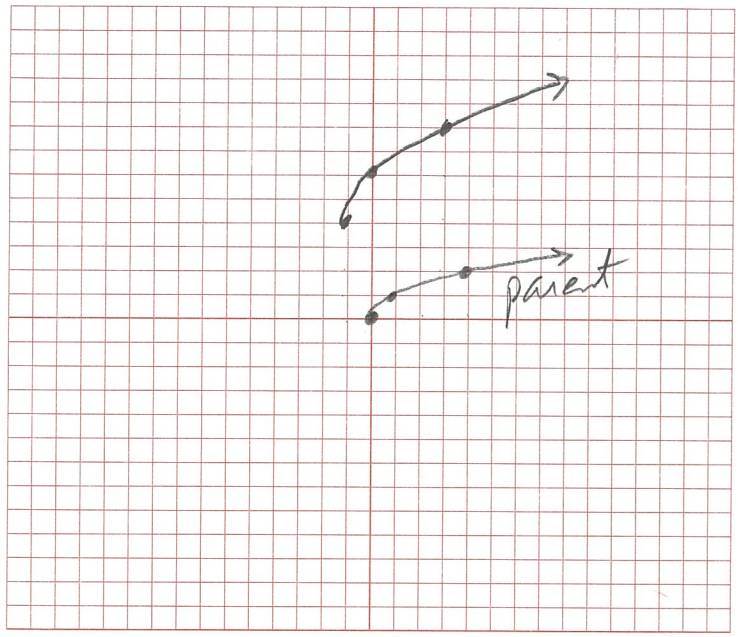
2. $y = -2\sqrt[3]{x-1}-3$

3. $y = 3\sqrt{x-2}-1$

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

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

6. $y = -2\sqrt{x+3}-2$



① $y = 2\sqrt{x+1} + 4$

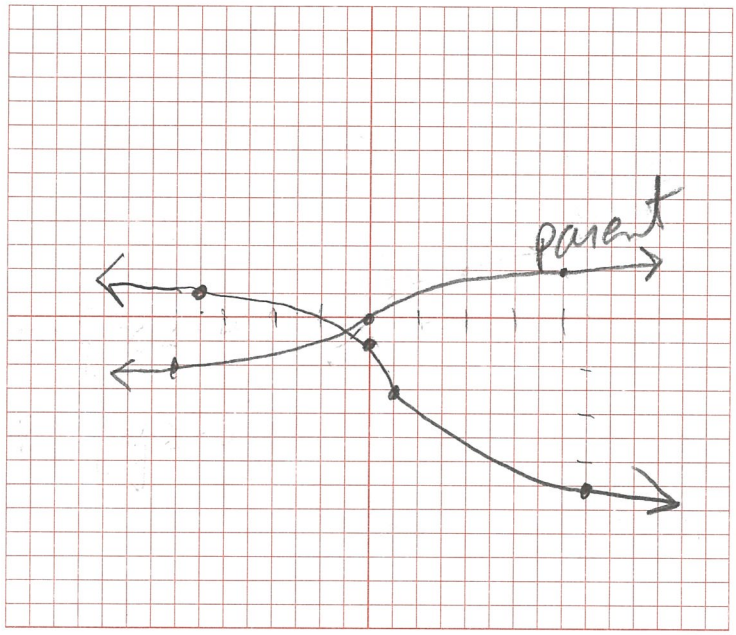
x	y
-1	4
0	6
3	8

(1) horizontal left 1x

(2) vertical sketch by factor of 2

(3) vertical translation up 4x

$D: \{x \geq -1\}$ $R: \{y \geq 4\}$



② $y = -2\sqrt[3]{x-1} - 3$

x	y
-7	1
0	-1
1	-3
9	-7

(1) Horizontal shift Rt 1x

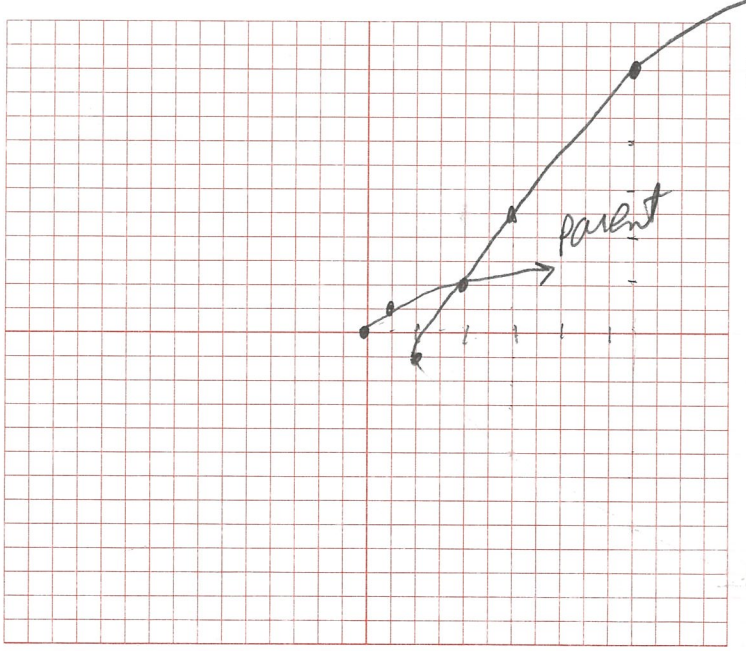
(2) Vertical sketch by factor of 2

(3) Reflect across x-axis

(4) Vertical shift down 3x

$D: \{\mathbb{R}\}$

$R: \{\mathbb{R}\}$



③ $y = 3\sqrt{x-2} - 1$

x	y
2	-1
6	5
11	8

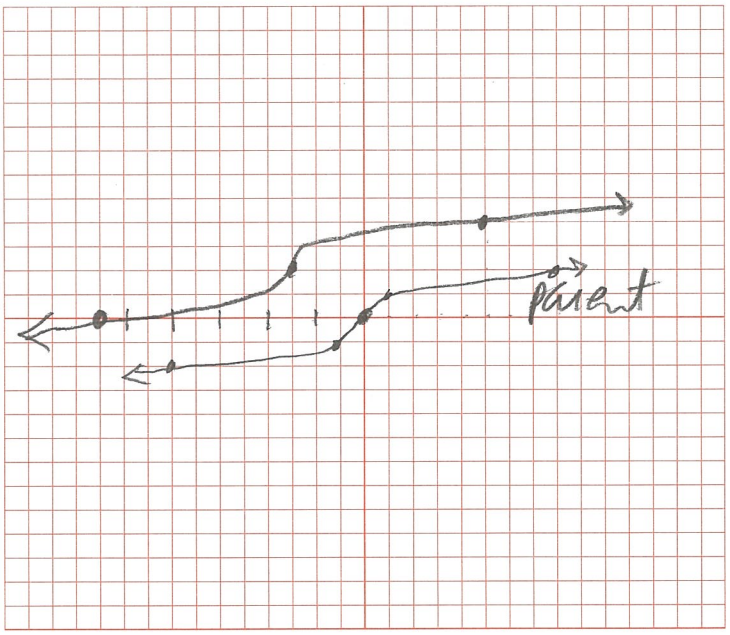
(1) Horizontal translate right 2x

(2) Vertical sketch by factor of 3

(3) Vertical translation down 1x

$D: \{x \geq 2\}$

$R: \{y \geq -1\}$



④ $y = \sqrt[3]{x+3} + 2$

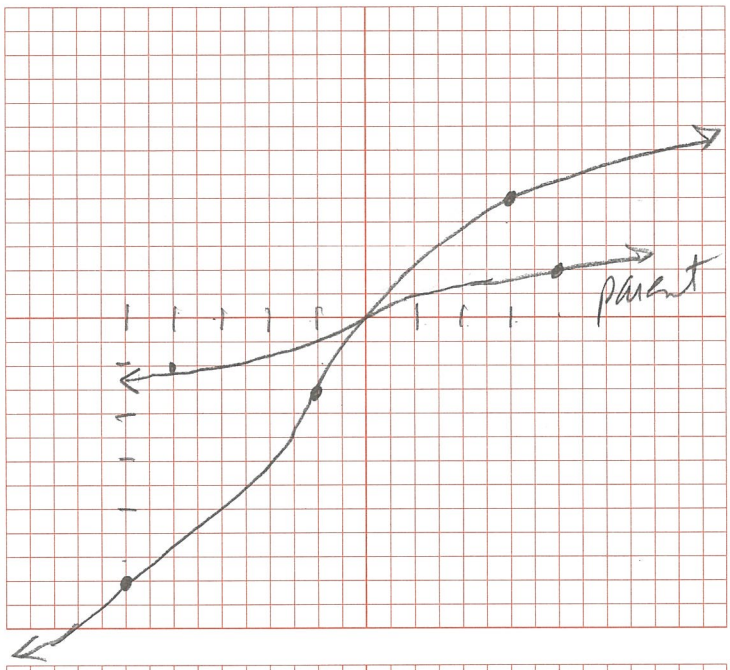
x	y
-11	0
-3	2
5	4

(1) Horizontal translation left 3x

(2) Vertical translation up 2x

D: {ℝ}

R: {ℝ}



⑤ $y = 4\sqrt[3]{x+2} - 3$

x	y
-10	-11
-2	-3
6	5

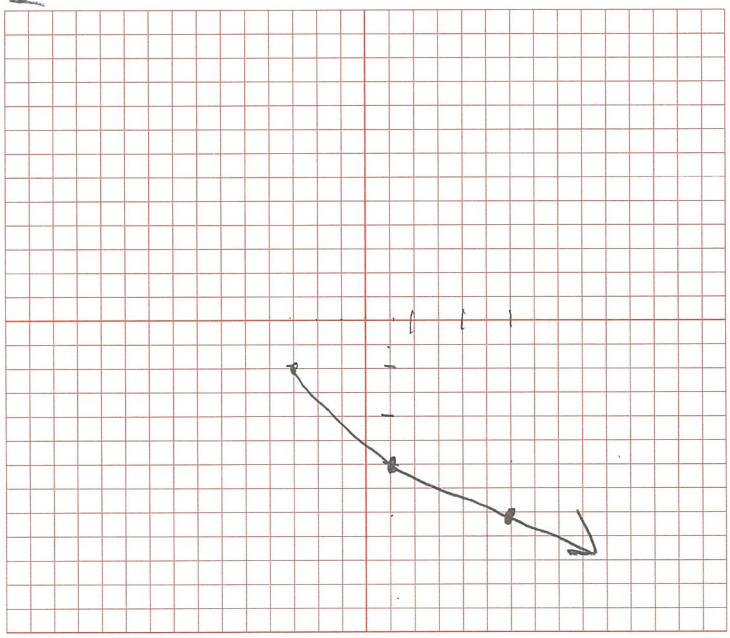
(1) Hor translate left 2x

(2) Vertical sketch factor of 4

(3) Vertical shift down 3x.

D: {ℝ}

R: {ℝ}



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

x	y
-3	-2
1	-6
6	-8

(1) Horiz. shift left 3x

(2) Vertical sketch factor of 2

(3) Reflect across x-axis

(4) Vertical shift down 2x

D: $\{x \geq -3\}$

R: $\{y \leq -2\}$