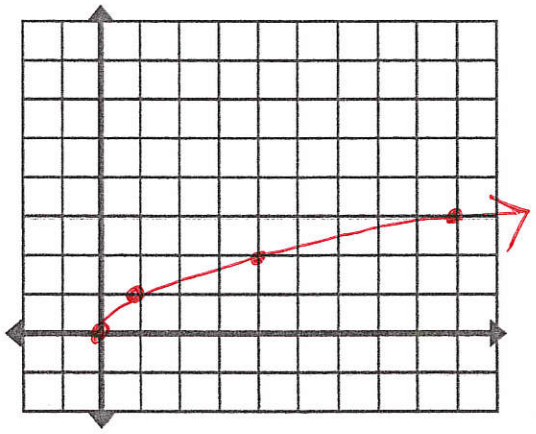
Key

7. U2D3 PRACTICE SHIFTS WITH SQUARE ROOT FUNCTION

Describe the transformations. Graph

$y = \sqrt{x}$

x	y
0	0
1	1
4	2
9	3

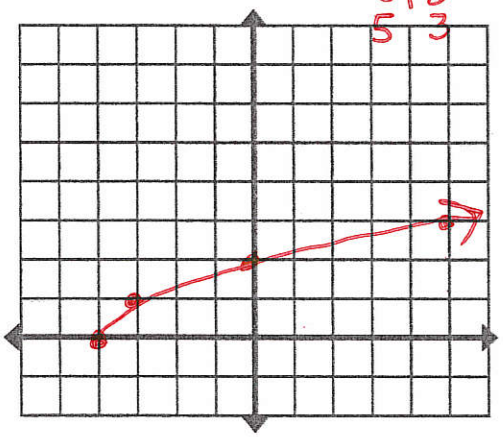


Section 1: Graph

1) $y = \sqrt{x+4}$

shift: c = -4, 4 left

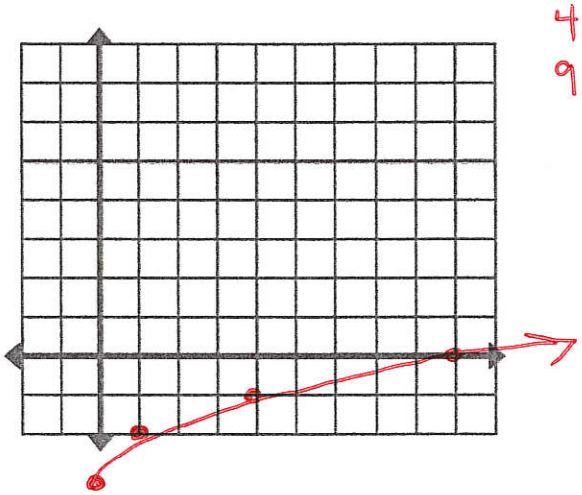
x	y
-4	0
-3	1
0	2
5	3



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

d = -3 down 3

x	y
0	-3
1	-2
4	-1
9	0



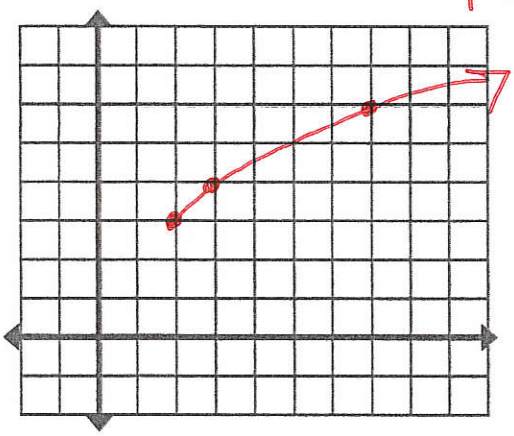
3). $y = \sqrt{x-2} + 3$

c = 2 rt

d = 3 up

shifts:

x	y
2	3
3	4
7	5

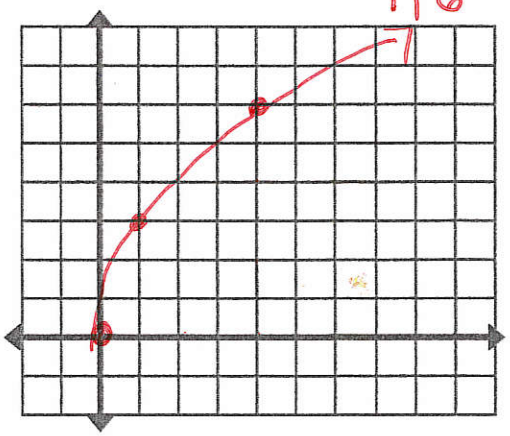


4) $y = 3\sqrt{x}$

a = 3

stretch:

x	y
0	0
1	3
4	6



$\left(\frac{x}{b}+c,\ ay+d\right)$

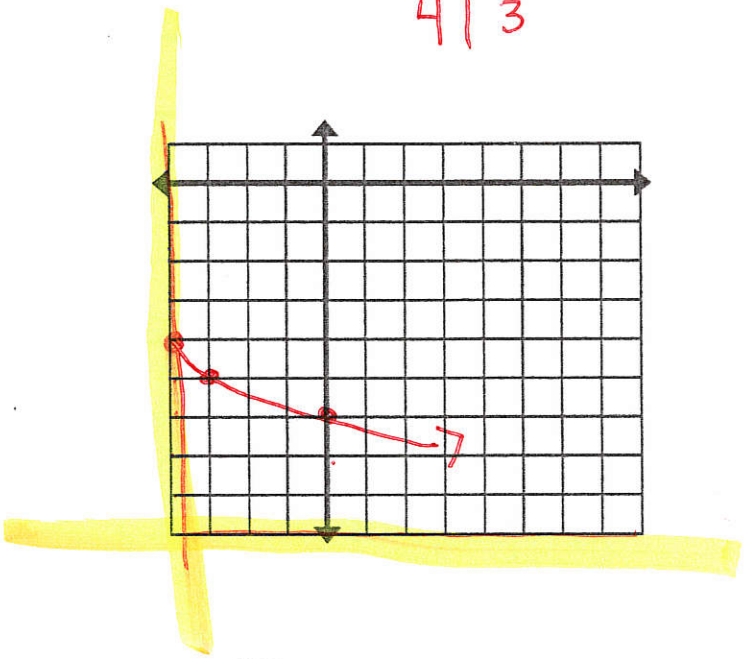
$a=-1$
$d=5$

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

$(x,\ -1y+5)$

shifts:

x	y
0	5
1	4
4	3

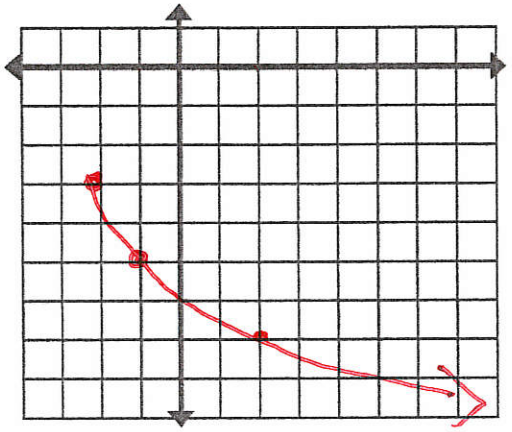


6) $y=-2\sqrt{x+2}-3$

$a=-2 \quad c=-2 \quad d=-3$

shifts:

x	y
x − 2	−2y − 3
−2	−3
−1	−5
2	−7

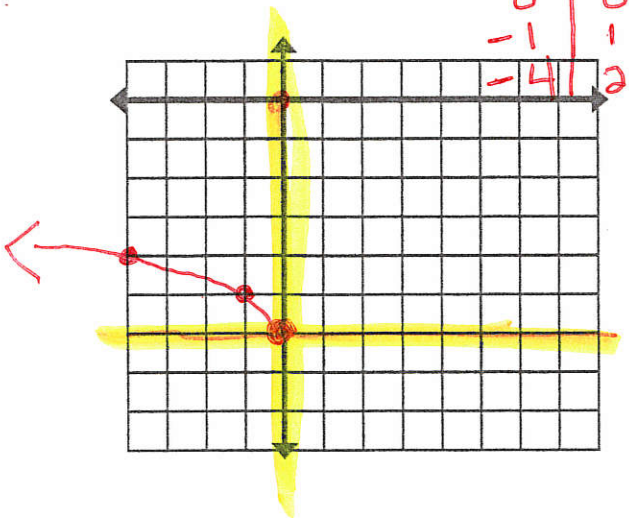


7. $y=\sqrt{-x}$

$b=-1$ reflect over y

$\left(\frac{x}{b}+c,\ ay+d\right)$

−x	y
0	0
−1	1
−4	2

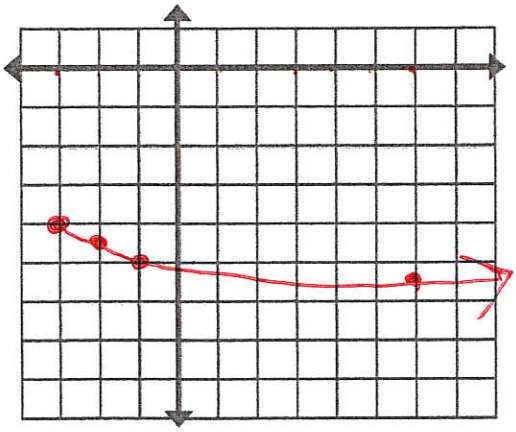


8. $y=-\frac{1}{2}\sqrt{x+3}-4$

$a=-\frac{1}{2} \quad c=-3 \quad d=-4$

$\left(\frac{x}{b}+c,\ ay+d\right)$

$\left(x-3,\ -\frac{1}{2}y-4\right)$



−3	−4
−2	−4.5
1	−5
6	−5.5

Key

7. U2D3 Function Transformations Practice 1

$Y = a\, f\,(b(x - c)) + d$ $\quad \left(\frac{x}{b} + c,\ ay + d\right)$

Write the EQUATIONS with described shifts and given parent functions.

b.a.f.a. = by a factor of

1) $y = \sqrt{x}$; Down 4 and Right 2 — 1. $y = \sqrt{x-2} - 4$

2) $y = x^3$; Reflects over x and Right 3 — 2. $y = -1(x-3)^3$

a = neg.

3) $y = \sqrt{x}$; Vertical Shrink b.a.f.o $^2/_5$, Left 7 — 3. $y = \frac{2}{5}\sqrt{(x+7)}$

a $\quad$ c

4) $y = x^3$; Down 2, Reflects over x, left 1 Vertical Stretch 4 — 4. $y = -4x^3 - 2$

$d = -2$ $\quad$ neg. $\quad$ $a = -4$

5) $y = \sqrt{x}$; Reflects over y, Vertical stretch of 3, Up 6 — 5. $y = 3\sqrt{-x} + 6$

$b = -1$ $\quad$ $a = 3$ $\quad$ $d = 6$

6) $y = x^3$; Vertical Shrink b.a.f.o. $^2/_3$, Left 9 — 6. $y = \frac{2}{3}(x+9)^3$

a

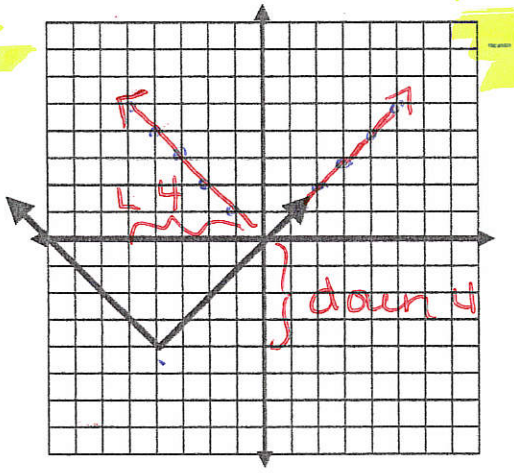
Use your knowledge of transformations and the absolute value parent function to write the equation of the functions graphed below.

7) Parent $= \sqrt{x}$

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

New

x	y
-4	-4



$d = -4$

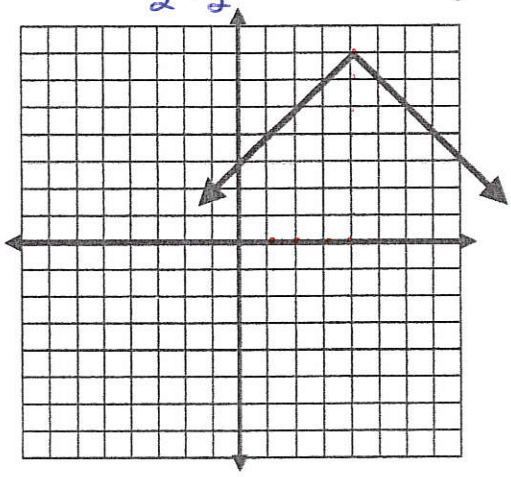
$c = -4$

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

8)

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

x'	y'



4 right $\Rightarrow c = 4$

up 7 $\Rightarrow d = 7$

flip over x $\Rightarrow$ a neg

$y = -\sqrt{x-4} + 7$

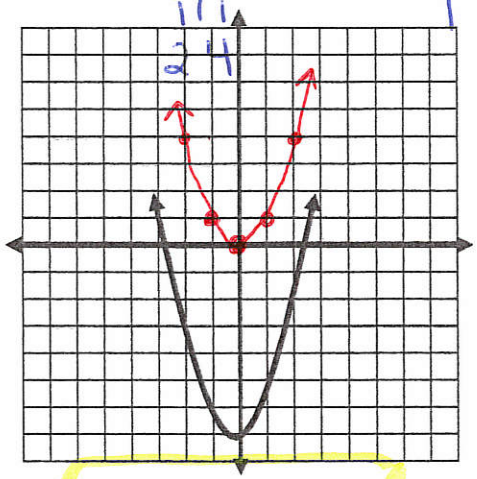
$y = x^2$

7. U2D3 Function Transformations Practice 1

9.

x	y
-2	4
-1	1
0	0
1	1
2	4

x	y
0	4



$y = x^2 - 4$

It's a bit off

10.

$y = x^3$ ⇒

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

down 2, left 5

new "center" · c = -5, d = -2

$y = (x+5)^3 - 2$

Graph using transformations

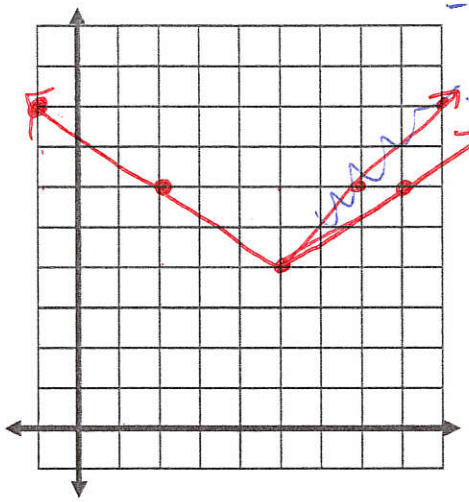
11) $y = \frac{2}{3}|x-5|+4$

$a = \frac{2}{3}$ $c = 5$ Rt d = up 4

$\left(\frac{x}{b}+c, ay+d\right) \rightarrow (x+5, \frac{2}{3}y+4)$

$y = |x| \rightarrow$

x	y
-6	6
-3	3
0	0
3	3
6	6



12. $y = 2(x+4)^2 + 3$

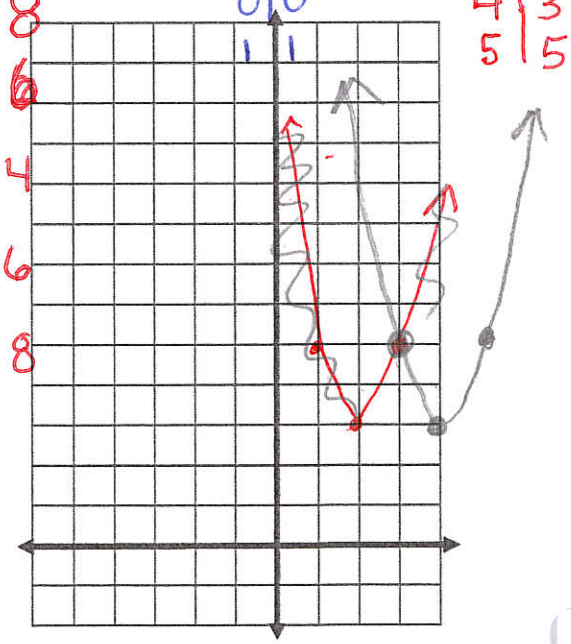
$a = 2$ $c = -4$ $d = 3$

$(x+4, 2y+3)$

x	$\frac{2}{3}y+4$
-1	8
2	6
5	4
8	6
11	8

x	$y = x^2$
-1	1
0	0
1	1

x	y
3	5
4	3
5	5



State the domain and range of #11.

#12.