Unit 1 Review
Sec Math 3

Name: Key
Date: _____ Class: _____

1. Name the parent function, then describe the following transformations in words.

a) $x-4$ — $f(x)=x$ — Shift down 4

b) x^2+5 — $f(x)=x^2$ — Shift up 5

c) $|-x|$ — $f(x)=|x|$ — H. Flip

d) $3\sqrt[3]{x}$ — $f(x)=\sqrt[3]{x}$ — V. Stretch by 3

e) $\frac{1}{4}\bullet 2^x$ — $f(x)=2^x$ — V. Compression by 1/4

f) $\sqrt{2x}$ — $f(x)=\sqrt{x}$ — H. Compression by 2

g) $-x^3$ — $f(x)=x^3$ — V. Flip

h) $(x+1)^2$ — $f(x)=x^2$ — Shift Left 1

2. Fill in each blank with the parent function that corresponds to each of the graphs given below.

$\sqrt{x}$ A)

x^2 B)

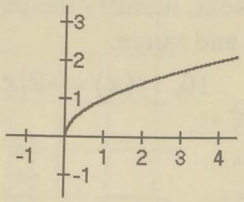
$\sqrt[3]{x}$ C)

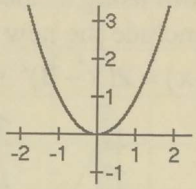
$|x|$ D)

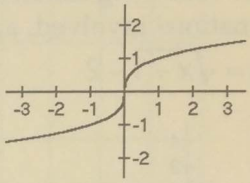
2^x E)

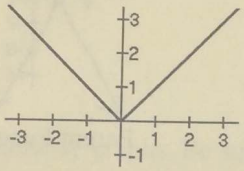
x^3 F)

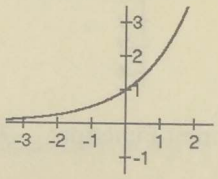
x G)

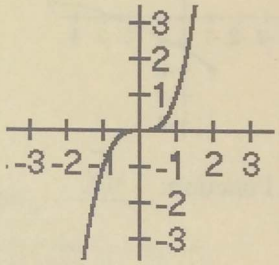
A)


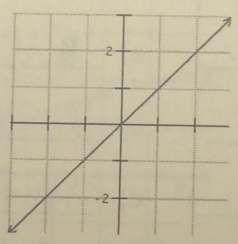
B)


C)


D)


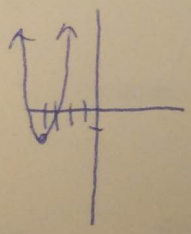
E)


F)


G)


List the attributes for the following parent functions. (Hint: You may want to draw a sketch of the graph)

3. $y=(x+4)^2-1$



Domain: $(-\infty,\infty)$

Range: $[-1,\infty)$

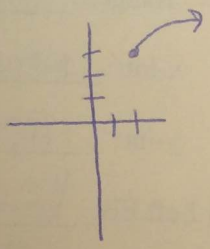
x-values Increasing: $(-4,\infty)$

Decreasing: $(-\infty,-4)$

↑ Left EB: $\lim_{x\to-\infty} f(x)=+\infty$

↑ Right EB: $\lim_{x\to+\infty} f(x)=+\infty$

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



Domain: $[2,\infty)$

Range: $[3,\infty)$

Increasing: $(2,\infty)$

Decreasing: None

Left EB: None

↑ Right EB: $\lim_{x\to+\infty} f(x)=+\infty$

Given the parent function $f(x)$, write the equation that contains the given transformations.

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

- Vertical Translation down two units (outside)
- Reflection across the y-axis (H. flip) (inside)

$f(x)=$ $\sqrt[3]{-x}-2$

6. $f(x)=|x|$

- Horizontal Translation right two units (inside)
- Reflection across the x-axis (V. Flip) (outside)

$f(x)=$ $-|x-2|$

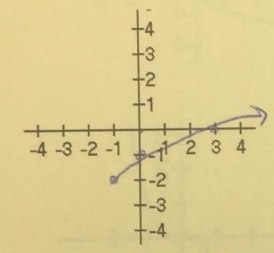
7. $f(x)=2^{(x)}$

- Vertical Compression by a factor of 2
- Horizontal Translation left 3 units

$f(x)=$ $\frac{1}{2}\cdot 2^{(x+3)}$

Graph the following functions **without** using a calculator. Next, identify the parent function, list the transformations involved, and also include the new domain and range.

8. $g(x)=\sqrt{x+1}-2$



Parent Function: $\sqrt{x}$

List the transformations in words:

a) Shift Left 1

b) Shift Down 2

Domain: $[-1,\infty)$

Range: $[-2,\infty)$

x-int: $(3,0)$

y-int: $(0,-1)$

Left EB: None

Right EB: $\lim_{x\to+\infty} f(x)=+\infty$

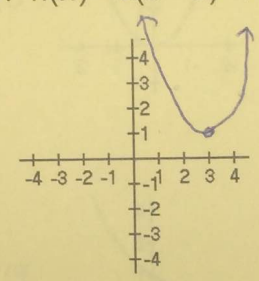
Inc: $(-1,\infty)$

Dec: None

x-values

9. $h(x)=2(x-3)^2+1$

$2(0+3)^2+1$
$2(9)+1$
$18+1$
19



Parent Function: x^2

List the transformations in words:

a) V. Stretch by 2

b) Shift Right 3

c) Shift Up 1

Domain: $(-\infty,\infty)$

Range: $[1,\infty)$

x-int: None

y-int: $(0,19)$

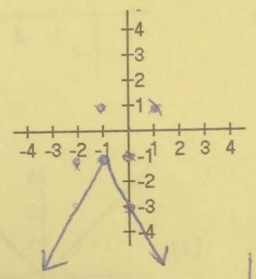
Left EB: $\lim_{x\to-\infty} f(x)=+\infty$

Right EB: $\lim_{x\to+\infty} f(x)=+\infty$

Inc: $(3,\infty)$

Dec: $(-\infty,3)$

10. $i(x)=-2|x+1|-1$



Parent Function: $|x|$

List the transformations in words:

a) V. Flip

b) V. Stretch by 2

c) Shift Left 1

d) Shift Down 1

Domain: $(-\infty,\infty)$

Range: $(-\infty,-1]$

x-int: None

y-int: $(0,-3)$

Left EB: $\lim_{x\to-\infty} f(x)=-\infty$

Right EB: $\lim_{x\to+\infty} f(x)=-\infty$

Inc: $(-\infty,-1)$

Dec: $(-1,\infty)$

Graph the piece-wise functions

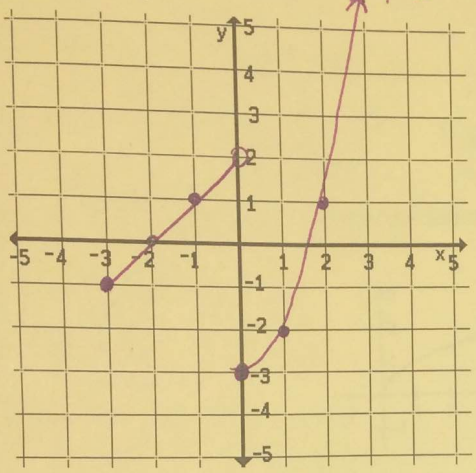
11. $f(x)=\begin{cases} x+2, & -3\le x<0 \\ x^2-3, & x\ge 0 \end{cases}$

$x+2$

x	y
-3	-1
-2	0
-1	1
0	2

x^2-3

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



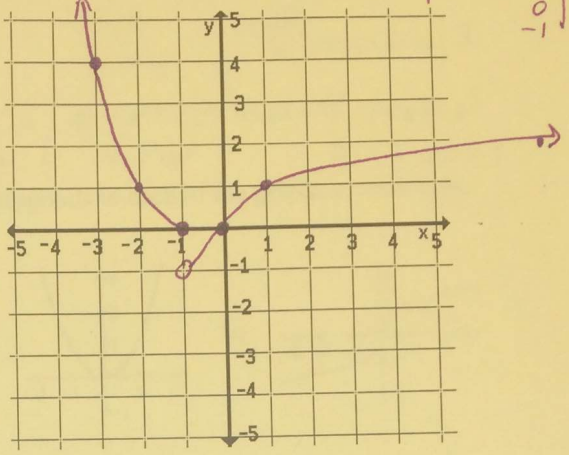
12. $f(x)=\begin{cases} (x+1)^2, & x\le -1 \\ \sqrt[3]{x}, & x>-1 \end{cases}$

$(x+1)^2$

x	y
-1	0
-2	1
-3	4

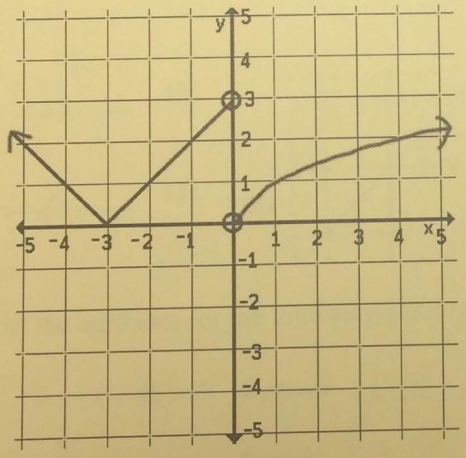
$\sqrt[3]{x}$

x	y
1	1
8	2
27	3
0	0
-1	-1



Write a function given the piecewise graphs. Be sure to include any domain restrictions!

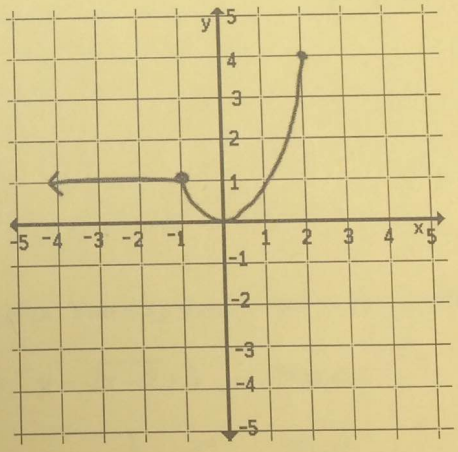
13.



Function:

$f(x)=\begin{cases} |x+3| & \text{if } x<0 \\ \sqrt{x} & \text{if } x>0 \end{cases}$

14.



Function:

$f(x)=\begin{cases} 1 & \text{if } x\le -1 \\ x^2 & \text{if } x>-1 \end{cases}$