Name: _____ **Unit 3:** Parent Functions & Transformations

Date: _____ **Bell:** _____ **Homework 1:** Piecewise Functions & Greatest Integer Functions

**** This is a 2-page document! ****

Given $a(x)=\begin{cases}|x-8| & \text{if } x\le -6\\ 2x-x^2 & \text{if } -6<x\le 1\\ -4x+7 & \text{if } x>1\end{cases}$ **, find each function value.**

1. $a(8)$

$-4(8)+7$
$-32+7$
-25

2. $a(1)$

$2(1)-(1)^2$
1

3. $a(-7)$

$|-7-8|$
$|-15| = 15$

4. $a(-3)$

$2(-3)-(-3)^2$
$-6-9$
-15

5. $a\left(-\frac{1}{2}\right)$

$2(-\frac{1}{2})-(-\frac{1}{2})^2$
$-1-\frac{1}{4}$
$5/4$

6. $a\left(\frac{9}{4}\right)$

$-4(\frac{9}{4})+7$
$-9+7$
-2

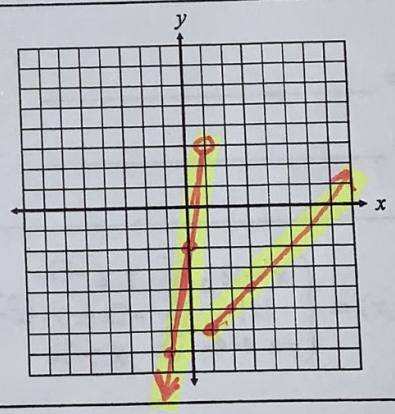
Graph each function. Identify the domain and range.

7. $f(x)=\begin{cases}5x-2 & \text{if } x<1\\ x-7 & \text{if } x\ge 1\end{cases}$

★ you should have t-charts for full credit!

$D =$ _____

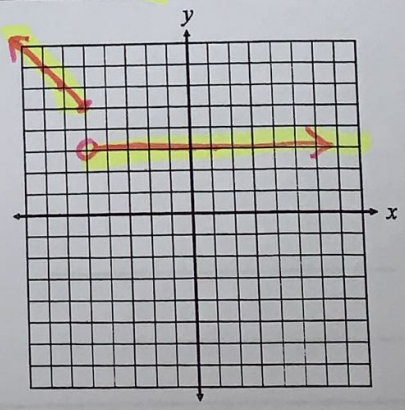
$R =$ _____



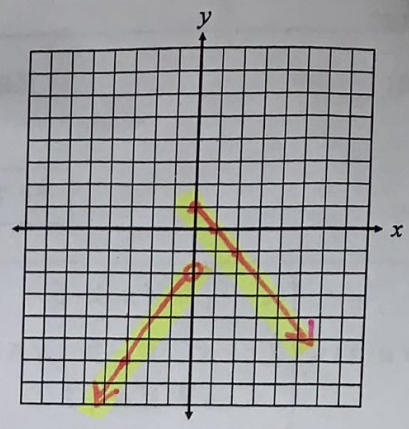
8. $g(x)=\begin{cases}-x & \text{if } x<-5\\ 3 & \text{if } x>-5\end{cases}$

$D =$ _____

$R =$ _____



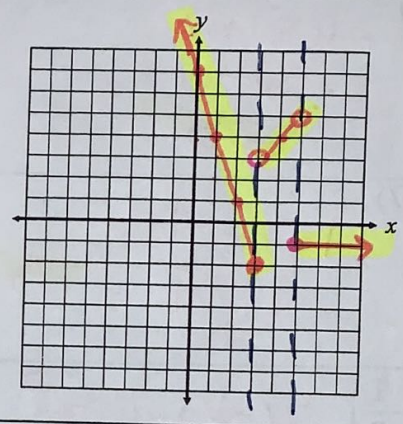
9. $h(x)=\begin{cases}\frac{4}{3}x-2 & \text{if } x<0\\ -x+1 & \text{if } x\geq 0\end{cases}$



$D=$ _____

$R=$ _____

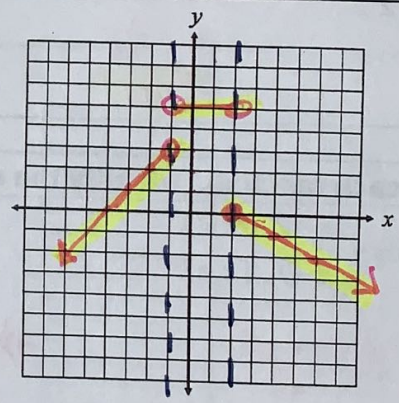
10. $p(x)=\begin{cases}-3x+7 & \text{if } x\leq 3\\ x & \text{if } 3<x<5\\ -1 & \text{if } x\geq 5\end{cases}$



$D=$ _____

$R=$ _____

11. $k(x)=\begin{cases}x+4 & \text{if } x<-1\\ 5 & \text{if } -1<x<2\\ -\frac{1}{2}x+1 & \text{if } x\geq 2\end{cases}$



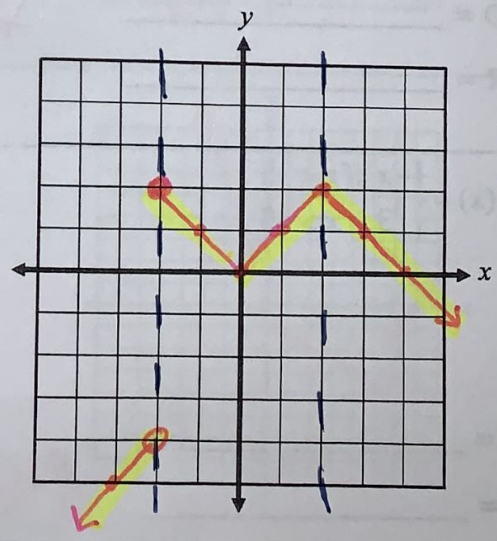
$D=$ _____

$R=$ _____

12.

$f(x)=\begin{cases}x-2, & \text{if } x<-2\\ |x|, & \text{if } -2\leq x\leq 2\\ -x+4, & \text{if } x>2\end{cases}$

x	y
-4	-6
-3	-5
-2	2
-1	1
0	0
1	1
2	2
3	1
4	0



$D=$ _____

$R=$ _____

Date _____

1. Solve. What would be the second step in solving the equation?

$$13 = (2-x)^{\frac{4}{5}} - 3$$

$(16)^{5/4} = ((2-x)^{4/5})^{5/4}$

$\sqrt[4]{16}^{5} = 2 - x$

$32 = 2 - x$

$x = -30$

2nd step is to raise both sides to $\frac{5}{4}$ power

2. What exponent would be used to eliminate the rational exponent in the equation?

$$(5x-8)^{\frac{3}{8}} = -27$$

8/3

3. Arrange the steps of solving for x in the correct order.

$$5 + (4x)^{\frac{3}{4}} = -59$$

3	Divide both sides by 4.
4	x = 64
1	Subtract 5 from both sides.
2	Raise both sides to the 4/3 power.

4. Ashley's answer is x = 129 and x = -114. What mistake, if any, did she make?

$$\sqrt[5]{2x-15} = 3$$

$2x - 15 = 243$	$2x - 15 = -243$
$2x = 258$	$2x = -228$
$x = 129$	$x = -114$

She shouldn't set up 2 problems. You only do that with absolute value equations.

5. Simplify. What expression will remain under the radical?

$$\sqrt[6]{384x^{10}g^{18}}$$

$\sqrt[6]{64 \cdot 6x^{10}g^{18}}$

$2xg^3\sqrt[6]{6x^4}$

6. What is the sixth root of 729?

3

7. Simplify.

$$\sqrt[3]{-54f^{14}}$$

$\sqrt[3]{-27 \cdot 2 \cdot f^{14}}$

$-3f^4\sqrt[3]{2f^2}$

8. Which is not written correctly in rational exponent form?

$$(\sqrt[4]{9})^5$$

a. $9^{\frac{4}{5}}$

b. $3^{\frac{5}{2}}$

c. $9^{\frac{5}{4}}$

d. They are all correct.

9. Rewrite in radical form. Do not simplify.

$$(-64)^{\frac{7}{2}}$$

$(\sqrt{-64})^7$

10. Solve for h.

$$(\sqrt[3]{h+5})^3 = (\sqrt[3]{4h})^3$$

$h+5=4h$

$5=3h$

$h=\frac{5}{3}$

11. Solve. Which of the solutions is extraneous and would not be included in the final answer?

$$(\sqrt{x+83})^2 = (x-7)^2$$

$\leftarrow (x-7)(x-7)$

$x+83 = x^2-14x+49$

$0 = x^2-15x-34$

$0 = (x-17)(x+2)$

$x-17=0$

$x=17$

$x+2=0$

$x=-2$

extraneous

12. Solve for x.

$$-|3x-5|-4=-10$$

$-|3x-5|=-6$

$|3x-5|=6$

$3x-5=6$

$3x=11$

$x=11/3$

$3x-5=-6$

$3x=-1$

$x=-1/3$

13. Solve for r.

$$\frac{|-3x-4|}{3}=12$$

$|-3x-4|=36$

$-3x-4=36$

$x=\frac{-40}{3}$

$-3x-4=-36$

$x=\frac{-32}{3}$

Use the piecewise function below to answer questions 14-16.

$$g(x)=\begin{cases} -3x+2, if\ x \le -2 \\ |x+1|, if\ -2 < x \le 4 \\ 5, if\ x > 4 \end{cases}$$

14. Evaluate for g(7). $=5$

15. Evaluate for g(-2). $-3(-2)+2=8$

16. Evaluate for g(0). $|0+1| = 1$

17. Describe the transformations applied to the parent function.

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

reflect over x-axis
shrink vertically by 1/2
up 6

18. Describe the transformations applied to the parent function.

$$y=5\sqrt[3]{x-4}-7$$

stretch vertically by
right 4
down 7

19. Describe the transformations applied to the parent function.

$$y=-|x+2|+4$$

reflect over x-axis
left 2 & up 4

20. Which points would be included on this piecewise function? (Select all that apply.)

$$g(x)=\begin{cases} 4x^2-1, if\ x \le -3 \\ |x|, if\ -3 < x \le 7 \\ 17, if\ x > 7 \end{cases}$$

a. (−2,2)
b. (0, −1)
c. (7,17)
d. (−4,63)
e. (−3,3)
f. (8,17)

$g(-2)=|-2|$
$=2$

$g(0)=|0|$
$=0$

$g(7)=|7|$
$=7$

$g(-4)=4(-4)^2-1$
$=63$

$g(-3)=4(-3)^2-1$
$=35$

$g(8)=17$

* also do Graphing Test Practice WKST

Algebra 2 Name Key ID: 1

Unit 4C Graphing Test Practice

Date_____ Period____

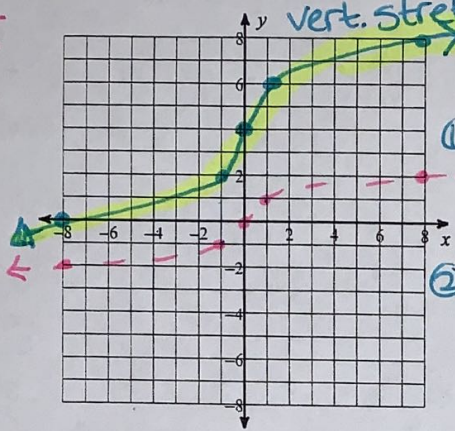
Sketch the graph of each function.

1) $y = 2\sqrt[3]{x} - 4$ a=2 h=0 K=4

vert. stretch by 2 + up 4

Parent $y=\sqrt[3]{x}$

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



① mult. y-coord. by 2 + move there

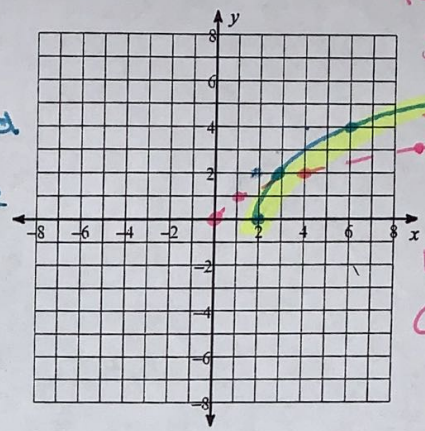
② then move up 4

2) $y = 2\sqrt{x-2}$ a=2 h=2 K=0

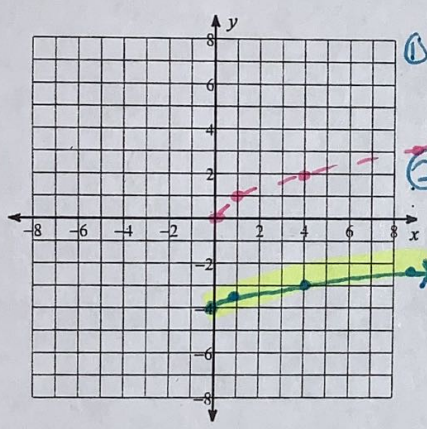
stretch by 2 + right 2

Parent $y=\sqrt{x}$

x	y
0	0
1	1
4	2
9	3



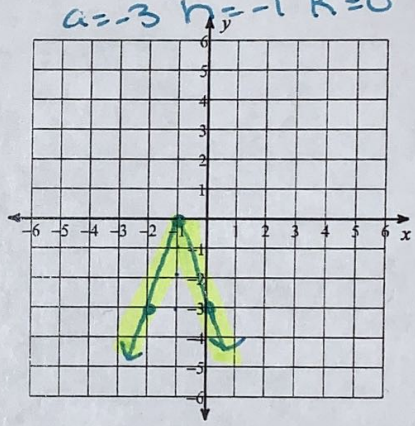
3) $y = \frac{1}{2}\sqrt{x} - 4$ $a=\frac{1}{2}$ h=0 K=-4



① mult. $\frac{1}{2}$ to y-coord.

② then move down 4

4) $y = -3|x+1|$ a=-3 h=-1 K=0



reflect over x-axis

left 1

vertex (-1,0)

use a like slope

$m = \frac{-3}{1}$ down 3 1 both dir.

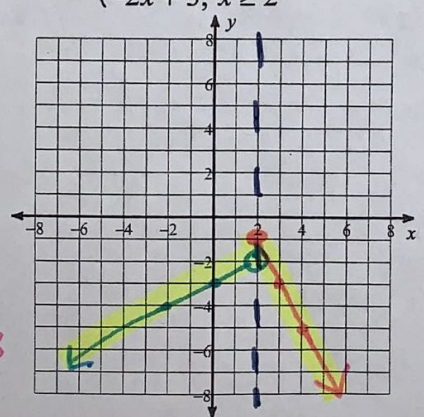
5) $f(x) = \begin{cases} \frac{1}{2}x - 3, & x < 2 \\ -2x + 3, & x \geq 2 \end{cases}$

$y=\frac{1}{2}x-3$

x	y
2	-2
0	-3
-2	-4

$y=-2x+3$

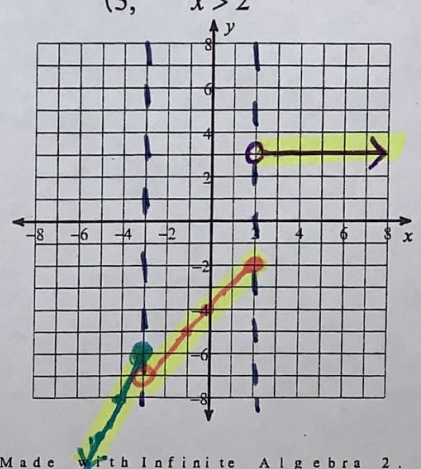
x	y
2	-1
3	-3
4	-5



6) $g(x) = \begin{cases} 2x, & x \leq -3 \\ x - 4, & -3 < x \leq 2 \\ 3, & x > 2 \end{cases}$

$y=2x$

x	y
-3	-6
-4	-8
-5	-10



$y=x-4$

x	y
-3	-7
-1	-5
0	-4
2	-2

$y=3$ horiz. line

x	y
2	3
3	3
4	3