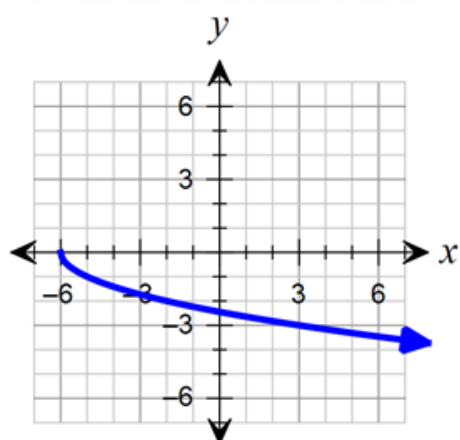


SM2 Analyzing Functions & Transformations Test Review

1. $f(x) = -\sqrt{x+6}$



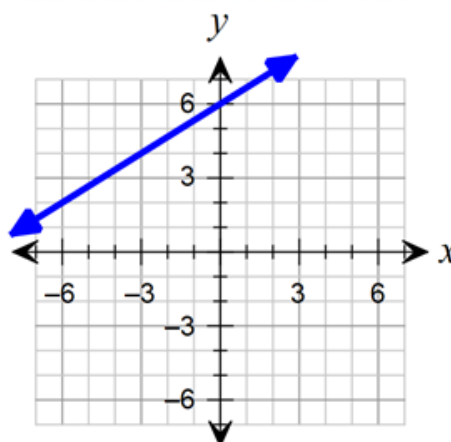
left to right

Domain: $[-6, \infty)$

Range: $(-\infty, 0]$

bottom to top
min to max

2. $f(x) = \frac{2}{3}x + 6$



left to right

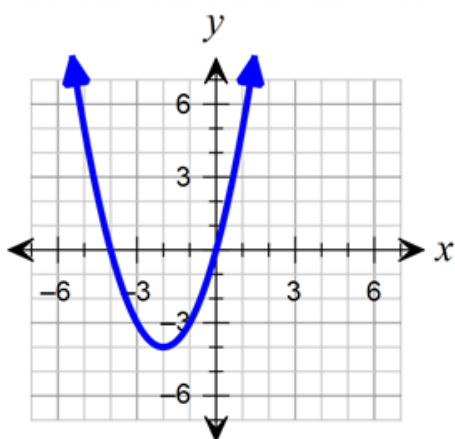
Domain: $(-\infty, \infty)$

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

bottom to top
min to max

3. $f(x) = x^2 + 4x$

domain is always $(-\infty, \infty)$ for lines, absolute value, and the x^2 functions



↪ ↪ Range is ↪ ↪
 $[\#, \infty)$

↩ ↩ Range is ↩ ↩
 $(-\infty, \#]$

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

Range: $[-4, \infty)$

↙ ↘
 Domain: $(-\infty, \infty)$
 Range: $(-\infty, \infty)$

The graph of $y = f(x)$ is shown below. Use it to answer the following questions.

4. Find $f(1)$. when x is 1 what is $y = -2$

$(1, ?)$ $y = -2$

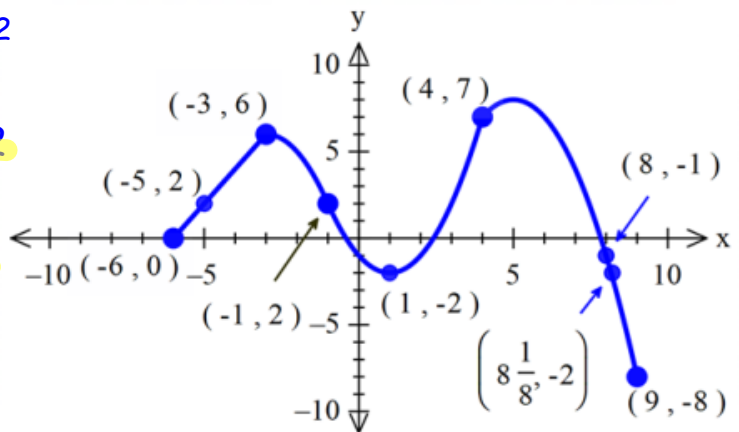
5. Find $f(-5)$. $(-5, ?)$? or $y = 2$

6. For what values of x is $f(x) = -2$?

when y is -2 x is what? $(?, -2)$ $x = 1, \& 8\frac{1}{8}$

7. For what values of x is $f(x) = -8$?

$x = 9$ $(?, -8)$



Find each value if $f(x) = x^2 - 3x + 4$, $g(x) = 3x - 5$, and $h(x) = \frac{x}{4 - 2x}$. Leave your answers as simplified fractions, if necessary. Show all your work.

8. $f(-2)$

$$x^2 - 3x + 4$$

$$(-2)^2 - 3(-2) + 4$$

$$14$$

9. $g(-3)$

$$3x - 5$$

$$3(-3) - 5$$

$$-14$$

10. $h(1)$

$$\frac{x}{4 - 2x}$$

$$\frac{1}{4 - 2(1)}$$

put bottom part in calculator first

$$\frac{1}{4 - 2}$$

$$\boxed{\frac{1}{2}}$$

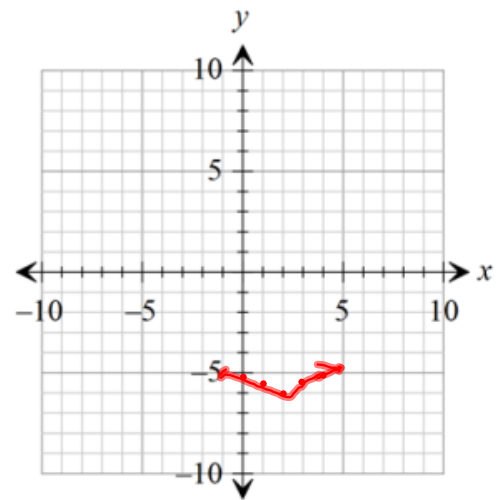
For each graph, do the following:

1. Identify the parent graph ($y = |x|$, $y = x^2$, or $y = \sqrt{x}$).
2. Fill in the x, y table for the parent graph.
3. Draw the graph of the parent graph with a dashed line.
4. List the transformations in the correct order.
5. Make a second x, y table to apply the reflections and stretches/compressions.
6. Make a third and final x, y table to apply the translations.
7. Draw the final graph with a solid line.
8. State the vertex or endpoint and domain of the final graph.

11. Graph this function: $g(x) = \frac{1}{4}|x-2|-6$

Parent Graph: $y=|x|$

- Transformations:
1. $a = 1/4$ so vertical shrink
 2. $h = 2$; moves right 2
 3. $k = -6$; moves down 6



parent graph

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

x	y
-2	$\frac{1}{2}$.5
-1	$\frac{1}{4}$.25
0	0
1	$\frac{1}{4}$.25
2	$\frac{1}{2}$.5

x	y
0	-5.5
1	-5.75
2	-6
3	-5.75
4	-5.5

Vertex: $(2, -6)$

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

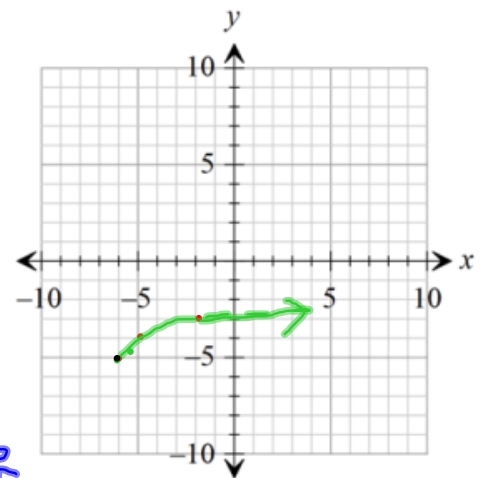
add 2 to x; subtract 6 from y

x stays same; y is multiplied by "a"
multiply y by 1/4

12. Graph this function: $y = \sqrt{x+6} - 5$

Parent Graph: $y = \sqrt{x}$

- Transformations:
1. $h = -6$, left 6
 2. $k = -5$; down 5



parent graph

x	y
0	0
1	1
4	2

new $y = a^x$

x	y
0	0
1	1
4	2

xth $y+k$

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

$0 + -5 = -5$
 $1 + -5 = -4$
 $2 + -5 = -3$

Endpoint: $(-6, -5)$ Domain: $[-6, \infty)$

$$\begin{aligned}
 0 + -6 &= -6 \\
 1 + -6 &= \\
 4 + -6 &=
 \end{aligned}$$

13. Graph this function: $f(x) = -2(x+1)^2 + 4$

Parent Graph: $y = x^2$

- Transformations:
1. flip
 2. vertical stretch by 2
 3. left 1
 4. up 4

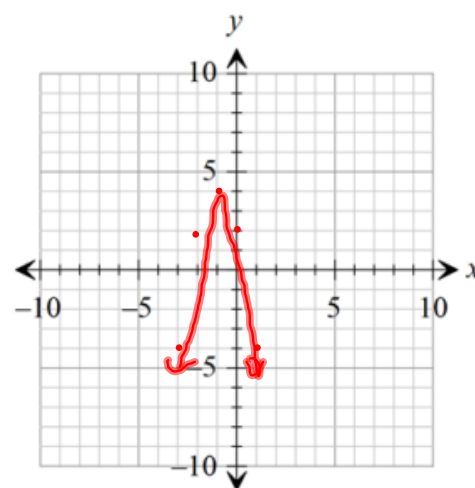
x	y
-2	4
-1	1
0	0
1	1
2	4

$-2y$

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

$x+1 \quad y+4$

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



Vertex: $(-1, 4)$

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