

KEY

Chapter 1 Review Practice Questions

1. Describe the transformations of the following:

a.  $y - 4 = f(x - 2)$

$$y = f(x - 2) + 4$$

2 units right  
4 units up

b.  $y = 3f(-2x + 10) + 7$

$$y = 3f(-2(x - 5)) + 7$$

vert. stretch by a factor of 3  
horiz. stretch by a factor of  $\frac{1}{2}$   
reflection about the y-axis  
5 units right, 7 units up

2. Write the mapping notation for the following transformations:

$$y = -f\left(\frac{1}{2}(x - 6)\right) + 2$$

$$(x, y) \rightarrow (2x + 6, -y + 2)$$

3. Given the mapping notation, write the corresponding function in the form of  $y = f(x)$ .

a.  $(x, y) \rightarrow (2x, y - 4)$

$$y = f\left(\frac{1}{2}x\right) - 4$$

b.  $(x, y) \rightarrow (-x + 3, -2y - 4)$

$$y = -2f(-(x - 3)) - 4$$

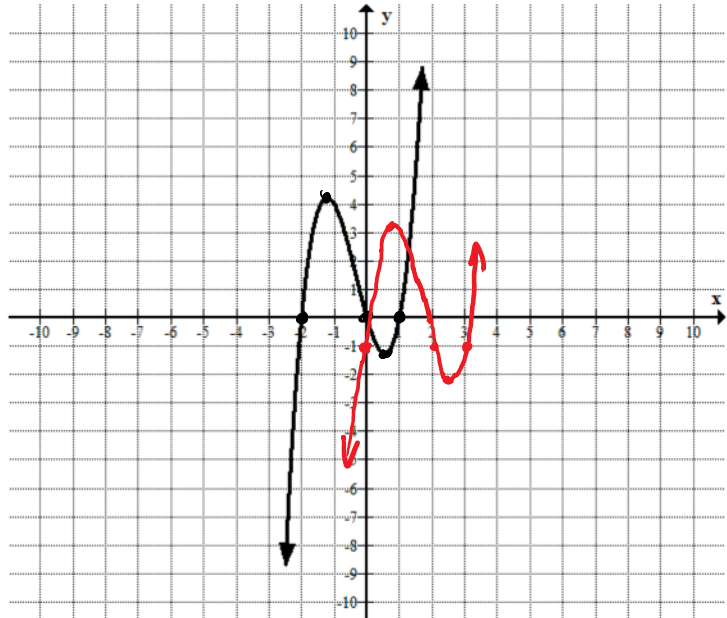
4. Given the function  $y = f(x)$  below, perform the following transformations and show your table of values.

$$y = f(x-2) - 1$$

x	y
-2	0
-1.2	4.2
0	0
0.5	-1.2
1	0

$x+2 \quad y-1$

x	y
0	-1
1.2	3.2
2	-1
2.5	-2.2
3	-1



State the domain and range (in set notation).

$$\{x \mid x \in \mathbb{R}\}$$

$$\{y \mid y \in \mathbb{R}\}$$

5. Given the function  $y = |x|$  write the function with the following transformation and, using the point  $(-2, 2)$  from the base function, determine the image point.

a.  $y = f(x-2) + 7$       $y = |x-2| + 7$       $(-2, 2) \rightarrow (0, 9)$

- b. Vertically translated 9 units down and horizontally translated 3 left

$$(-2, 2) \rightarrow (x-3, y-9) \rightarrow (-5, -7)$$

$$y = |x+3| - 9$$

- c. Horizontally translated 5 right and vertically translated 2 up

$$y = |x-5| + 2$$

$$(-2, 2) \rightarrow (3, 4)$$

6. Given the function  $y = f(x)$  below, graph the equation  $y = -2g(-x-3)-1$   $y = -2g(-(x+3))-1$

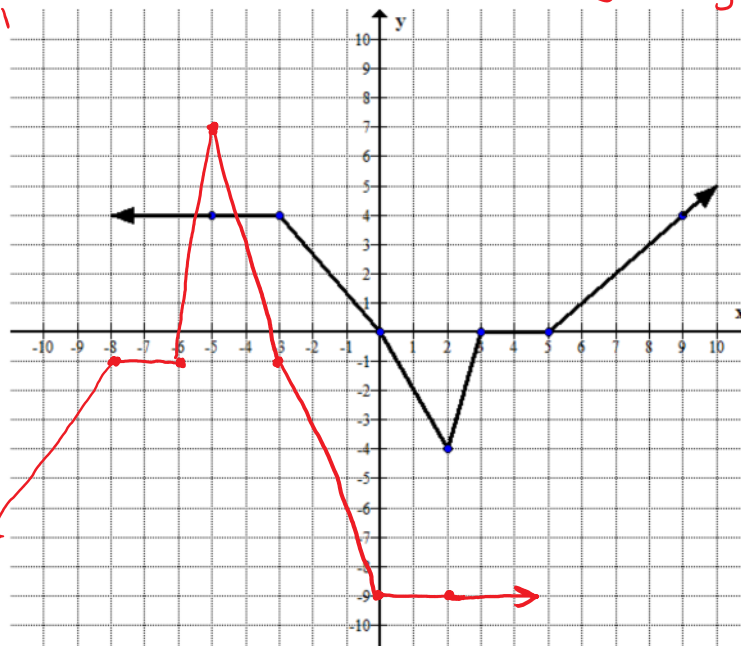
x	y
-5	4
-3	4
0	0
2	-4
3	0
5	0
9	4

$-x - 2y$

x	y
5	-8
3	-8
0	0
-2	8
-3	0
-5	0
-9	-8

$x-3-2y-1$

x	y
2	-9
0	-9
-3	-1
-5	7
-6	-1
-8	-1
-12	-9



State the domain and range:

$\{x \mid x \in \mathbb{R}\}$   
 $\{y \mid y \leq 7, y \in \mathbb{R}\}$

7. Graph the function  $y = -\frac{1}{2}(x-3)^2 + 6$  AND state the domain and range.

$y = x^2$

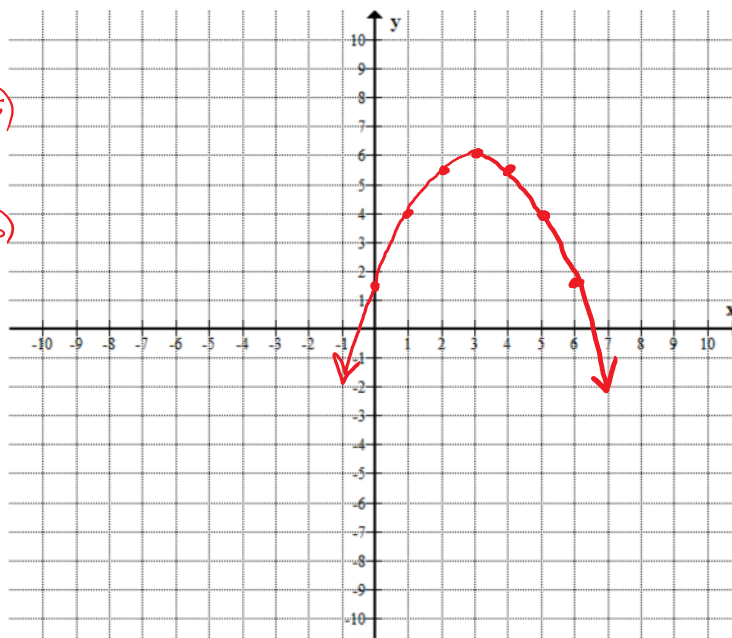
x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9

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

x	y
-3	$-\frac{9}{2}$
-2	-2
-1	$-\frac{1}{2}$
0	0
1	$-\frac{1}{2}$
2	-2
3	$-\frac{9}{2}$

$x+3-\frac{1}{2}y+6$

x	y
0	$\frac{3}{2}$ (1.5)
1	4
2	$\frac{11}{2}$ (5.5)
3	6
4	$\frac{11}{2}$
5	4
6	$\frac{3}{2}$



State the domain and range:

$\{x \mid x \in \mathbb{R}\}$   
 $\{y \mid y \leq 6, y \in \mathbb{R}\}$

8. Write the equation  $y = f(x)$  with the transformations described below:

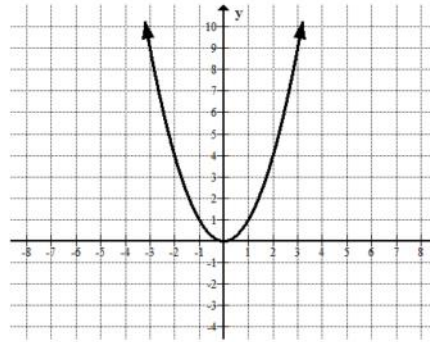
- a. A reflection about the x-axis, vertically compressed by a factor of  $\frac{1}{3}$ , horizontally expanded by a factor of 2, and translated 3 units left and 4 units **up**.

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

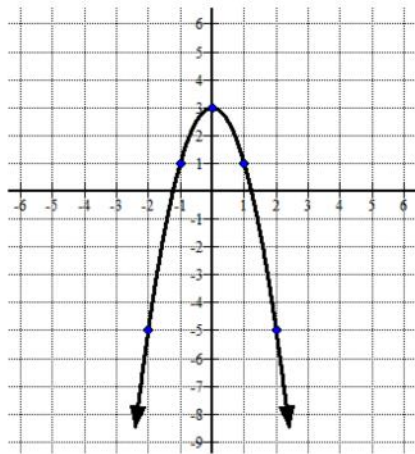
- b. A reflection about the y-axis, vertically expanded by a factor of 2, horizontally compressed by a factor of  $\frac{1}{2}$ , and translated 2 units right and 1 unit **down**.

$$y = 2f(-2(x-2)) - 1$$

9. Given the following graph of the function  $y = x^2$ , determine the equation of the transformed functions below.



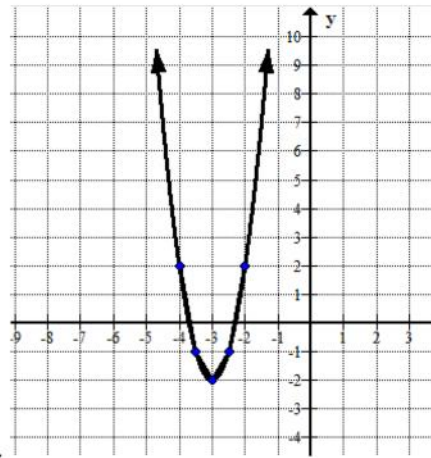
$$y = -2x^2 + 3$$



State the domain and range of each:

$$\{x \mid x \in \mathbb{R}\}$$

$$\{y \mid y \leq 3, y \in \mathbb{R}\}$$

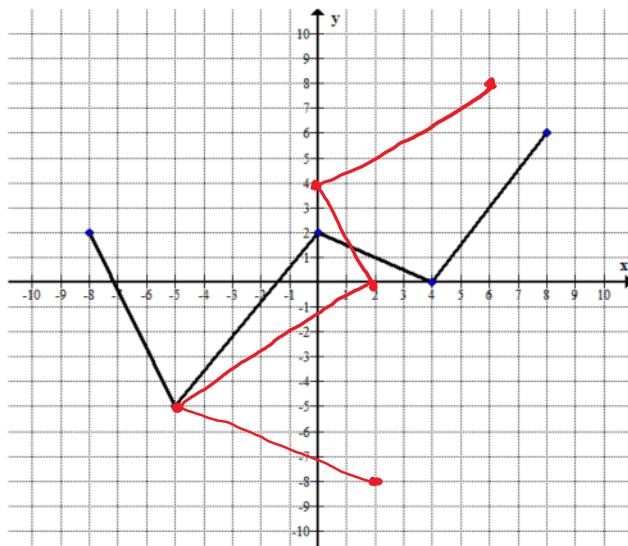


$$y = (2(x+3))^2 - 2$$

$$\{x \mid x \in \mathbb{R}\}$$

$$\{y \mid y \geq -2, y \in \mathbb{R}\}$$

10. Graph the inverse of the given function,  $y = f(x)$ :



$x$	$y$
2	-8
-5	-2
6	8

11. Determine the equation of the inverse for each of the following:

a.  $y = -2x + 3$

$$x = -2y + 3$$

$$x - 3 = -2y$$

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

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

b.  $y = \frac{1}{2}(x - 4)^2 - 3$

$$x = \frac{1}{2}(y + 3)^2 - 3$$

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

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

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

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

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

$$(x - 4)^2 = (\sqrt{2y - 1})^2$$

$$(x - 4)^2 = 2y - 1$$

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

$$y = \frac{(x - 4)^2 + 1}{2}$$

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

$$(3y - 1)x = 2y$$

$$3yx - x = 2y$$

$$3yx - 2y = x$$

$$y(3x - 2) = x$$

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

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