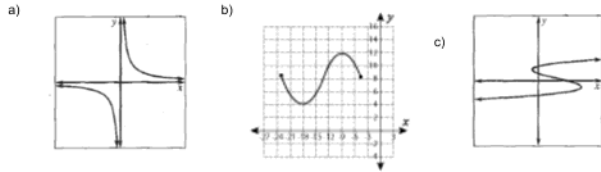


PreCalc 12 Chapter 1 Assignment – hand in for completion marks

Name: _____

1. For each graph below, state whether or not it is a function. (Yes/No)



2. State the domain for each of the following functions. Give the domain in set notation.

a) $f(x) = \frac{5x}{2x-1}$

b) $f(x) = \sqrt{3x+4}$

3. State what happens to the graph of the function with equation $y = f(x)$ when the equation is changed to each of the following:

a) $y = f(x-8)$

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

c) $y = 3f(x)$

d) $y = f(4x)$

e) $5y = f(x)$

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

g) $y = -f(x)$

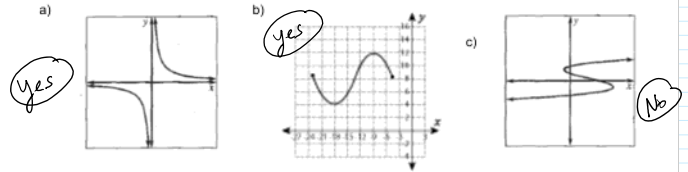
h) $y = f(-x)$

i) $-y = f(x)$

PreCalc 12 Chapter 1 Assignment – hand in for completion marks

Name: Key

1. For each graph below, state whether or not it is a function. (Yes/No)



2. State the domain for each of the following functions. Give the domain in set notation.

a) $f(x) = \frac{5x}{2x-1}$

b) $f(x) = \sqrt{3x+4}$

radicand ≥ 0
 $3x+4 \geq 0$
 $3x \geq -4$
 $x \geq -\frac{4}{3}$

$\{x \mid x \neq \frac{1}{2}, x \in \mathbb{R}\}$

$\{x \mid x \geq -\frac{4}{3}, x \in \mathbb{R}\}$

3. State what happens to the graph of the function with equation $y = f(x)$ when the equation is changed to each of the following:

a) $y = f(x-8)$

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

c) $y = 3f(x)$

right 8

up 2

VE 3

d) $y = f(4x)$

e) $5y = f(x)$

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

HC $\frac{1}{4}$

VC $\frac{1}{5}$

HE 2

g) $y = -f(x)$

h) $y = f(-x)$

i) $-y = f(x)$

reflect across
x-axis

reflect across
y-axis

reflect across
x-axis

4. For each of the following, write the mapping notation that shows where points on $y = f(x)$ go to:

a) $y = -2f\left(\frac{1}{3}(x-5)\right) - 7$

b) $y = 2f(-4x+12)+9$

5. Given each mapping notation, write the new function equation that $y = f(x)$ will change into.

a) $(x, y) \rightarrow (4x, y+8)$

b) $(x, y) \rightarrow (-x-5, y-2)$

6. The base function $y = \sqrt{x}$ contains the point $(4, 2)$.

For each part below

- Write the new equation that results when $y = \sqrt{x}$ is transformed as described
- Give the new image point for $(4, 2)$. (Where does $(4, 2)$ get mapped to?)

a) $y = f(x-4)+9$

b) base function, $y = \sqrt{x}$, is translated 8 units down and translated 3 units left

4. For each of the following, write the mapping notation that shows where points on $y = f(x)$ go to:

a) $y = -2f\left(\frac{1}{3}(x-5)\right) - 7$
 = VE 2 • reflect across x-axis
 HE 3 right
 7 down
 $(x, y) \rightarrow (3x+5, -2y-7)$

b) $y = 2f(-4x+12)+9$
 Factor! $y = 2f(-4(x-3))+9$
 VE 2
 HC $\frac{1}{4}$ reflect across y
 3 right
 up 9
 $(x, y) \rightarrow \left(-\frac{1}{4}x+3, 2y+9\right)$

5. Given each mapping notation, write the new function equation that $y = f(x)$ will change into.

a) $(x, y) \rightarrow (4x, y+8)$
 HE by 4, up 8
 $y = f\left(\frac{1}{4}x\right) + 8$

b) $(x, y) \rightarrow (-x-5, y-2)$
 - reflect across y-axis
 - 5 left
 - 2 down
 $y = f(-(x+5)) - 2$

6. The base function $y = \sqrt{x}$ contains the point $(4, 2)$.

For each part below

- Write the new equation that results when $y = \sqrt{x}$ is transformed as described
- Give the new image point for $(4, 2)$. (Where does $(4, 2)$ get mapped to?)

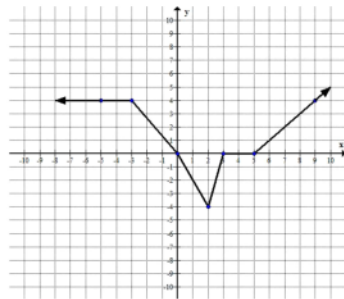
a) $y = f(x-4)+9$
 - 4 right
 - 9 up
 $y = \sqrt{x-4} + 9$
 image point: $(8, 11)$

b) base function, $y = \sqrt{x}$, is translated 8 units down and translated 3 units left
 $y = \sqrt{x+3} - 8$
 image point: $(1, -6)$

7. Given the function $y = f(x)$ below

a) Fill in the table of key points for the original function, then create the table of values for the transformed graph, $y = f(x+2) - 4$ and sketch it on the same grid.

x	y



b) State the domain and range of the TRANSFORMED GRAPH, using set notation.

8. Write the new equation that results when $y = f(x)$ is transformed as listed below:

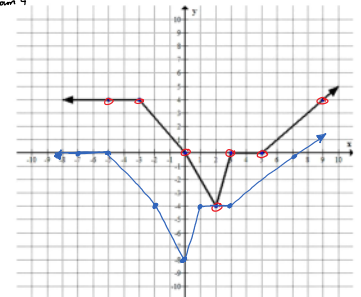
a) Reflected across the x-axis, vertically compressed by a factor of $\frac{1}{4}$, horizontally expanded by a factor of 3, and translated 2 units left and 4 units down.

b) Reflected across the y-axis, vertically expanded by a factor of 5, horizontally compressed by a factor of $\frac{1}{2}$, and translated 6 units right and 2 units up.

7. Given the function $y = f(x)$ below

a) Fill in the table of key points for the original function, then create the table of values for the transformed graph, $y = f(x+2) - 4$ and sketch it on the same grid.

x	y	x-2	y-4
-5	4	-7	0
-3	4	-5	0
0	0	-2	-4
2	-4	0	-8
3	0	1	-4
5	0	3	-4
9	4	7	0



b) State the domain and range of the TRANSFORMED GRAPH, using set notation.

domain: $\{x \mid x \in \mathbb{R}\}$
 range: $\{y \mid y \geq -8, y \in \mathbb{R}\}$

8. Write the new equation that results when $y = f(x)$ is transformed as listed below:

a) Reflected across the x-axis, vertically compressed by a factor of $\frac{1}{4}$, horizontally expanded by a factor of 3, and translated 2 units left and 4 units down.

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

b) Reflected across the y-axis, vertically expanded by a factor of 5, horizontally compressed by a factor of $\frac{1}{2}$, and translated 6 units right and 2 units up.

$$y = 5f(-2(x-6)) + 2$$

9. Shown on the grid is the graph of $y = f(x)$. Consider the equation $y = 2f(-x+2) - 1$

- Write the mapping.

- Fill in the tables showing 4 key points on the original graph along with their final image points after the transformations are done.

x	y

x	y



- Sketch the graph of $y = 2f(-x+2) - 1$ on the grid.

9. Given that $y = f(x)$ contains the point $(-6, 12)$, find its image point after each of the following transformations.

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

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

c) $y = -f(2(x+4)) - 1$

d) $y = 2f(-3x-15) + 7$

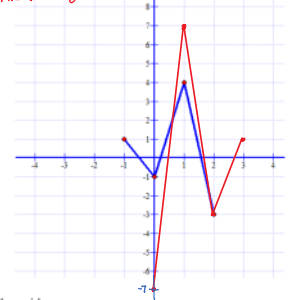
9. Shown on the grid is the graph of $y = f(x)$. Consider the equation $y = 2f(-x+2) - 1$

- Write the mapping. *To get the correct mapping, FACTOR first!* $y = 2f(-1(x-2)) - 1$

- Fill in the tables showing 4 key points on the original graph along with their final image points after the transformations are done.

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

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



- Sketch the graph of $y = 2f(-x+2) - 1$ on the grid.

9. Given that $y = f(x)$ contains the point $(-6, 12)$, find its image point after each of the following transformations.

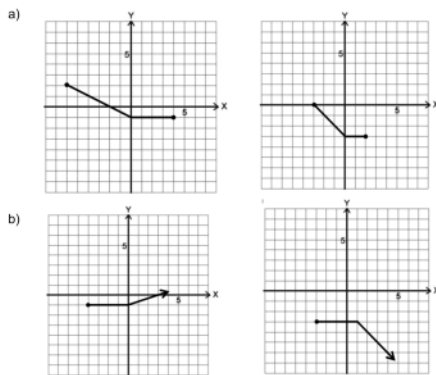
a) $y = 2f\left(-\frac{1}{3}x\right)$ $(x,y) \rightarrow (-3x, 2y)$
VE 2
HE 3
reflect across y
 $(-6, 12) \rightarrow (18, 24)$

b) $y = -\frac{1}{2}f(x) + 6$ $(x,y) \rightarrow (x, -\frac{1}{2}y + 6)$
VC 1/2
reflect across x-axis
up 6
 $(-6, 12) \rightarrow (-6, 0)$

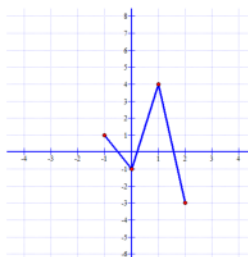
c) $y = -f(2(x+4)) - 1$ $(x,y) \rightarrow (\frac{1}{2}x - 4, -y - 1)$
reflect across x-axis
HC 1/2, left 4
down 1
 $(-6, 12) \rightarrow (-7, -13)$

d) $y = 2f(-3x-15) + 7$ $(x,y) \rightarrow (-\frac{1}{3}x - 5, 2y + 7)$
Factor first!!
VE 2
HC 1/3
reflect across y-axis
5 left
7 up
 $(-6, 12) \rightarrow (-3, 31)$

10. Given that the graph of the function $y = f(x)$ is shown on the left, determine the equation of the function on the right.



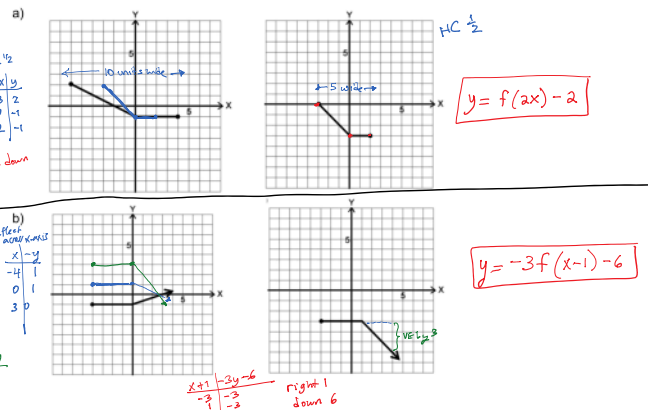
11. Graph the inverse of the function shown below. Fill in the tables showing the original's key points, and the inverse's key points.



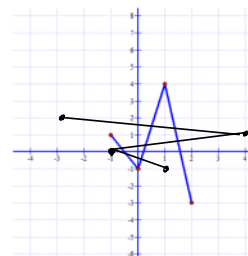
x	y

x	y

10. Given that the graph of the function $y = f(x)$ is shown on the left, determine the equation of the function on the right.



11. Graph the inverse of the function shown below. Fill in the tables showing the original's key points, and the inverse's key points.



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

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

Note: This doesn't look exactly like the reflection across the line $y = x$. The reason for that is that the grid isn't square - boxes are wider across than they are tall. That throws off the shape.

12. Determine the equation of the inverse for each of the following. Show the process clearly.

a) $y = 4x - 3$

b) $y = \sqrt{2x-10} + 3$

c) $y = \frac{4x}{5x-8}$

12. Determine the equation of the inverse for each of the following. Show the process clearly.

a) $y = 4x - 3$

1) trade

$$x = 4y - 3$$

2) solve for y

$$x = 4y - 3$$

$$\frac{x+3}{4} = \frac{4y}{4}$$

$$y = \frac{x+3}{4}$$

b) $y = \sqrt{2x-10} + 3$

1) $x = \sqrt{2y-10} + 3$

2) $x = \sqrt{2y-10} + 3$

$$(x-3)^2 = (\sqrt{2y-10})^2$$

$$(x-3)^2 = 2y - 10$$

c) $y = \frac{4x}{5x-8}$

1) $x = \frac{4y}{5y-8}$

2) $(5y-8)x = \left(\frac{4y}{5y-8}\right) \cdot (5y-8)$

$$(5y-8)x = 4y$$

$$5xy - 8x = 4y$$

$$-8x = 4y - 5xy$$

$$\frac{-8x}{4-5x} = \frac{y(4-5x)}{4-5x}$$

$$y = \frac{-8x}{4-5x}$$

also correct: $y = \frac{8x}{5x-4}$