Name:_____ Date;_____

Math 12 Enriched HW Section 2.6 Inverse, Reciprocal and ABS Transformations:

1. Given that the coordinate (a,b) is on the function $y = f(x)$, indicate what the coordinates becomes after each transformation:

a) $y = \frac{1}{f(x)}$	b) $y = \frac{-3}{f(4x)}$
c) $x = f(y)$	d) $x = \frac{-0.5}{f(3y)}$
e) $y = \lvert f(x) \rvert$	f) $y = f(\lvert x \rvert)$
m) $y = \frac{1}{f(x-2)+3}$	n) $x = \frac{1}{f(-y+3)+2} + 2$

2. Given the table of values for the function $y = f(x)$, fill in the TOV for the other functions:

$y = f(x)$

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

$a)\ y = \lvert f(x) \rvert$

x	y

$b)\ \lvert y \rvert = f(x)$

x	y

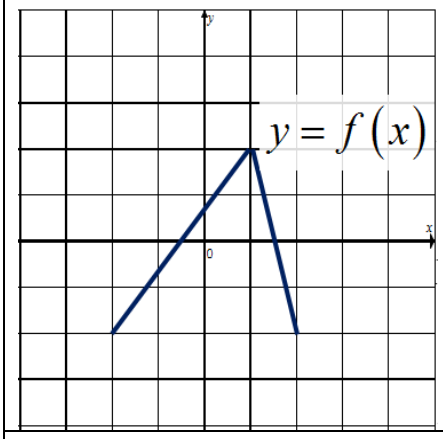
$c)\ y = f(\lvert x \rvert)$

x	y

3. The point (6,12) is on $y=f(x)$. What does point become for each function below?

a) $y=3f(x-2)+4$	b) $y=\dfrac{1}{f(x+3)}+8$
c) $y=\left\|\dfrac{1}{f(2x)}\right\|+7$	d) $y=f^{-1}(x)$
e) $2x=f(3y)$	f) $y=f^{-1}(2x-1)$

4. Given the graph of $y=f(x)$, draw the graph of the following functions:



a) $y=2\left|f(x)\right|$

b) $\left|y\right|=f(x)$

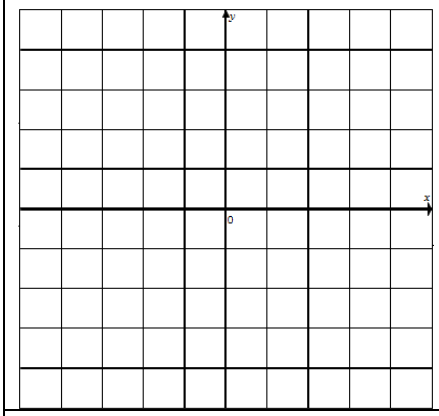
c) $y=f(\left|x\right|)$

d) $\left|y\right|=f(\left|x\right|)$

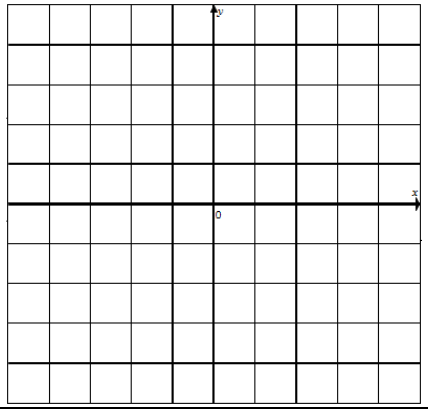
f) $x=f(y)$

5. Use transformations to graph the following equations:

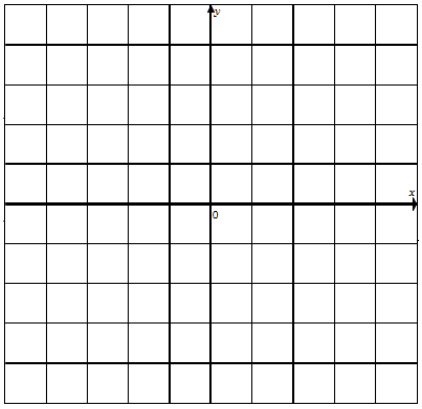
a) $y = \sqrt{|x|}$



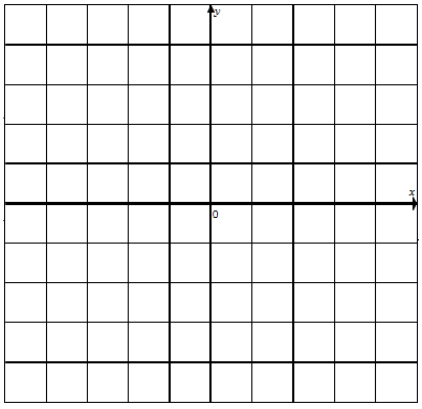
b) $y = \sqrt{|2x|} + 1$



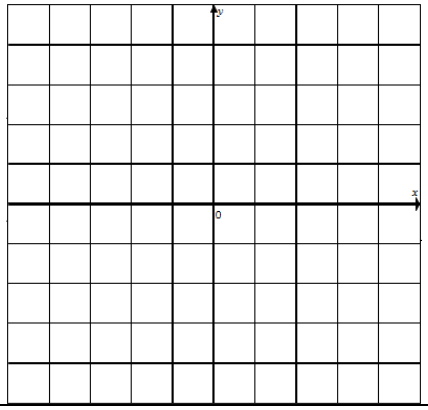
c) $3 = |x + y|$



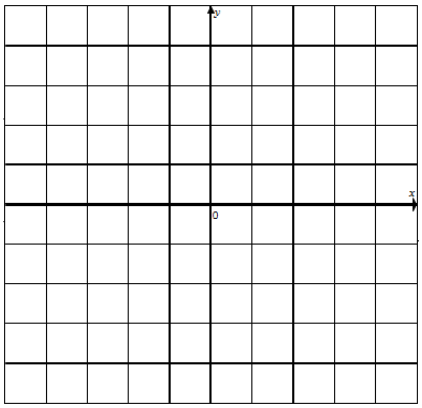
d) $3 = |x| + |y|$



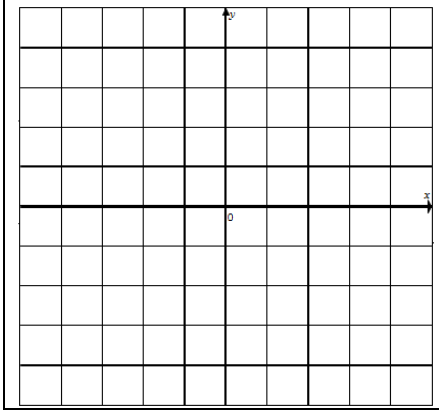
e) $y = (|x| - 4)^2 + 1$



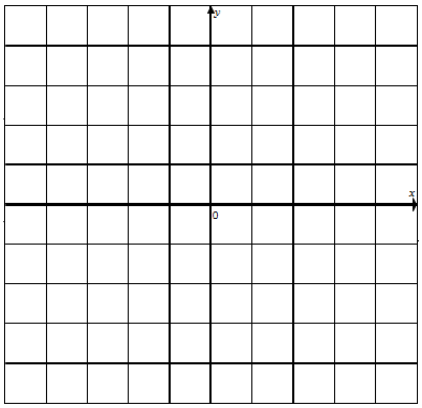
f) $y = \dfrac{1}{|x| + 1}$



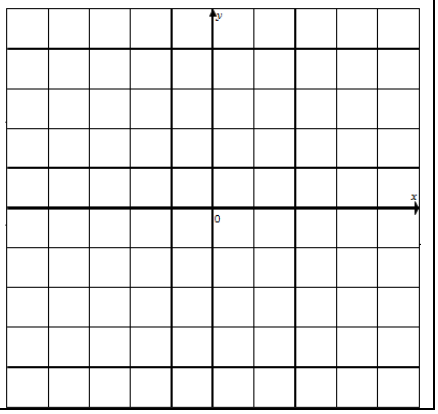
d) $y = \sqrt{4 - |x|} + 1$



e) $|y| = \sqrt{4 - x} + 1$



f) $(|x| - 1)^2 + (|y| - 1)^2 = 1$



6. Invariant points are points that do not change after a transformation. Given the function $f(x)=(x-2)^2-1$, what are the invariant point(s) for the following transformations?

a) $y=f(-x)$	b) $y=-f(x)$
c) $x=f(y)$	d) $y=f(4x)$
e) $y=\dfrac{1}{f(x)}$	f) $y=\dfrac{1}{2}f(x)$

7. The function $y=4x^2+4x+1$ is shifted three units right to become $y=(2x-k)^2$. What is the value of "k"?

8. The graph of $y=\dfrac{1}{x}$ is transformed to $y=3\left|\dfrac{1}{2x+4}\right|+4$, what are the transformations involved? Indicate all transformations in order.

9. What are the x-intercepts of the function $y=|x|^2-3|x|+2$

10. What is the area encompassed by the quadrilateral created by the relation: $|y| + \frac{4}{3}|x| = 6$

11. Given that the area of the shape encompassed by the relation is 50units^2, then what is the value of "k"? $|y| + \frac{4}{3}|x| = k$

12. What is the area of the region enclosed by the graph of the equation: $x^2 + y^2 = |y| + |x|$

13. What is the volume of the region enclosed by the graph of $|y| + |x| + |z| \leq 1$

14. What is the volume of the region enclosed by the graph of $|y| + |x| + |z - 1| \leq 1$

15. Point $C(a,b)$ is on the graph of $y = f(x)$.

a) What point must be on the graph of $y = -\frac{1}{3}f(x+4)$?

b) What point must be on the graph of $y = \frac{1}{f(x-2)} + 3$?

c) If point C is the vertex of a parabola that opens up, what is the domain and range of $y = f^{-1}(x)$?

d) If point C is the vertex of a parabola that opens up, and $a > 0$, $b < 0$, what is the domain and range of $y = |f(x)|$?