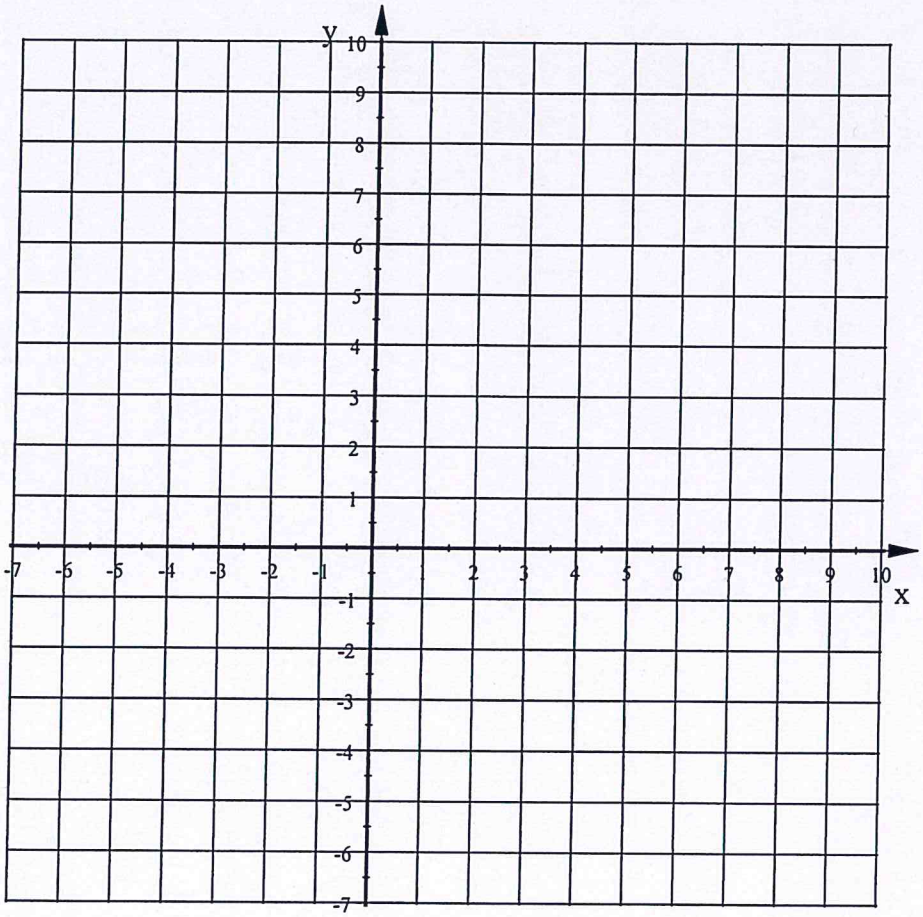
Alg 2 Sheet #2 Inverse Relations Fall 2019 Name:

1. Plot the following points and connect them to form the parabola representing the function $f(x) = 2(x+4)^2 + 1$

$A(-6,9), B(-5,3), C(-4,1), D(-3,3), E(-2,9)$



2. Take each ordered pair and switch the x and y-coordinates then plot the new points on the same graph from question 1. Do this with all five points and connect them with a smooth curve to form a new relation.
Example: $A(-6,9)$ becomes $A'(9,-6)$.

	$A(-6,9)$	$B(-5,3)$	$C(-4,1)$	$D(-3,3)$	$E(-2,9)$
becomes	$A'(9,-6)$	$B'($ $)$	$C'($ $)$	$D'($ $)$	$E'($ $)$

a) Describe what this new graph looks like.

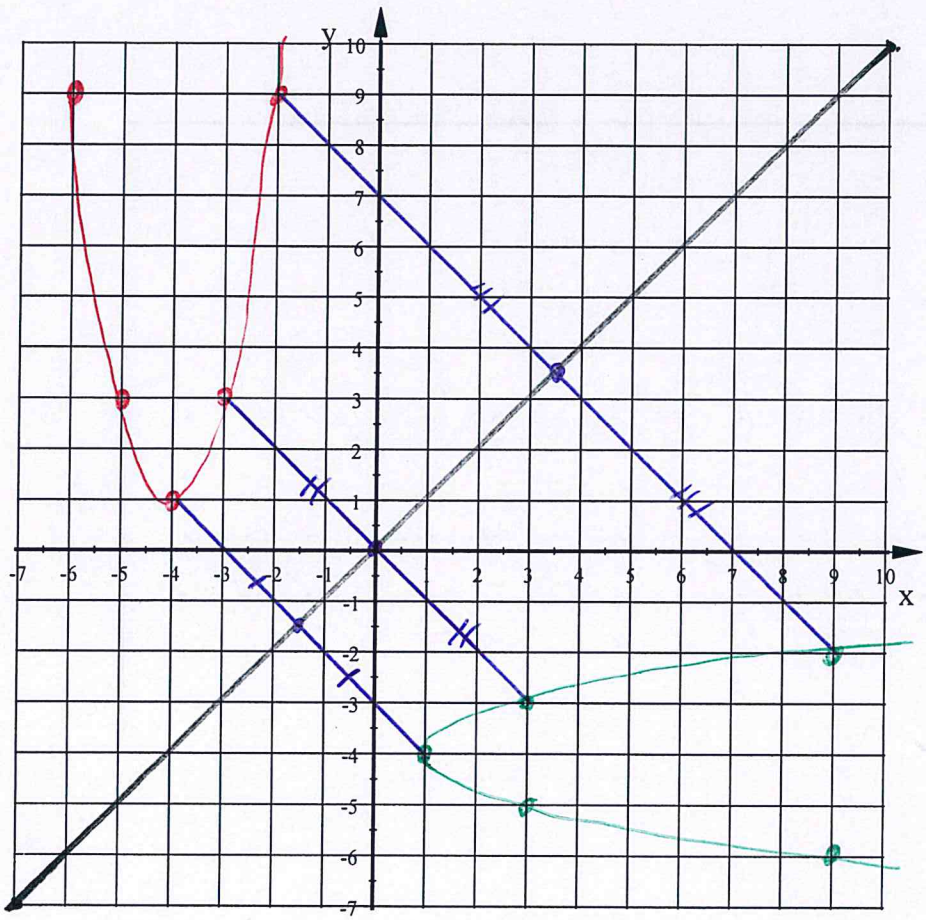
b) Is this inverse relation a function?

3. You have just created the **inverse relation** of $f(x)$. The inverse is denoted by the symbol $f^{-1}(x)$
The graph of $f^{-1}(x)$ is actually a reflection of the original $f(x)$ over a line. Find the equation for this line of reflection.
(Remember, a Line of Reflection is the line that is equidistant from corresponding points on $f(x)$ and $f^{-1}(x)$. i.e. it's exactly in the middle of the two graphs). One way to find the Line of Reflection is to fold your paper so that the two graphs match up. The fold line is the Line of Reflection. Another way to find the Line of Reflection is to connect corresponding points on the two graphs with a segment, i.e. A with A', find the midpoint of these segments, then write the equation of the line formed by connecting this midpoints.
Eq of Line of Reflection: $y =$

Alg 2 Sheet #2 Inverse Relations Fall 2019 Name: Answers

1. Plot the following points and connect them to form the parabola representing the function $f(x) = 2(x+4)^2 + 1$

$A(-6,9), B(-5,3), C(-4,1), D(-3,3), E(-2,9)$



2. Take each ordered pair and switch the x and y-coordinates then plot the new points on the same graph from question 1. Do this with all five points and connect them with a smooth curve to form a new relation. Example: $A(-6,9)$ becomes $A'(9,-6)$.

	$A(-6,9)$	$B(-5,3)$	$C(-4,1)$	$D(-3,3)$	$E(-2,9)$
becomes	$A'(9,-6)$	$B'(3,-5)$	$C'(1,-4)$	$D'(3,-3)$	$E'(9,-2)$

a) Describe what this new graph looks like.

sideways parabola

b) Is this inverse relation a function? NO

3. You have just created the **inverse relation** of $f(x)$. The inverse is denoted by the symbol $f^{-1}(x)$

The graph of $f^{-1}(x)$ is actually a reflection of the original $f(x)$ over a line. Find the equation for this line of reflection.

(Remember, a Line of Reflection is the line that is equidistant from corresponding points on $f(x)$ and $f^{-1}(x)$. i.e. it's exactly in the middle of the two graphs). One way to find the Line of Reflection is to fold your paper so that the two graphs match up. The fold line is the Line of Reflection. Another way to find the Line of Reflection is to connect corresponding points on the two graphs with a segment, i.e. A with A', find the midpoint of these segments, then write the equation of the line formed by connecting this midpoints.

Eq of Line of Reflection: $y =$ $y = x$