

# Algebra II - Transformation Exploration

Name \_\_\_\_\_ Date \_\_\_\_\_

## PARENT GRAPH

- 1) On Grid A, plot the graph of  $y = |x|$  using the following x-values: -3, -2, -1, 0, 1, 2, and 3.
- 2) Connect the points using a straight-edge. Extend your lines to the edge of the graph.
- 3) What shape does an **absolute value** graph make?

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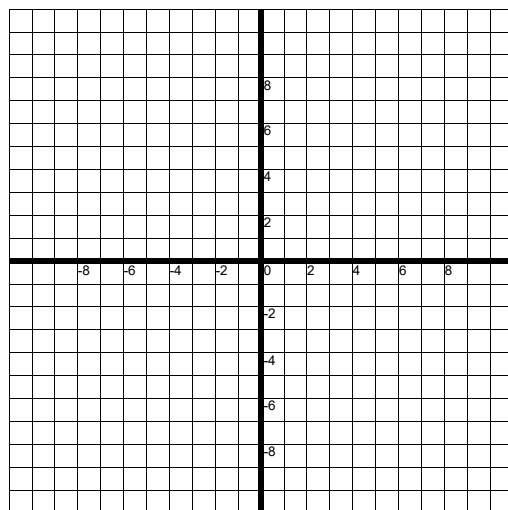
## TRANSLATIONS

- 4) On Grid B, redraw the graph of  $y = |x|$  with a light colored pencil.
- 5) Also on Grid B, use a different color to plot the graph of  $y = |x| + 3$  using the same x-values -3, -2, -1, 0, 1, 2, and 3. Again, use a straight edge to connect the points. Be sure to label both of your graphs.
- 6) How does the graph of  $y = |x| + 3$  compare with the graph of  $y = |x|$ ? Write your answer below:

- 7) On Grid C, redraw the graph of  $y = |x|$  with a light colored pencil.
- 8) Also on Grid C, use a different color to plot the graph of  $y = |x| - 6$  using the same x-values -3, -2, -1, 0, 1, 2, and 3. Again, use a straight edge to connect the points. Be sure to label both of your graphs.
- 9) How does the graph of  $y = |x| - 6$  compare with the graph of  $y = |x|$ ? Write your answer below:

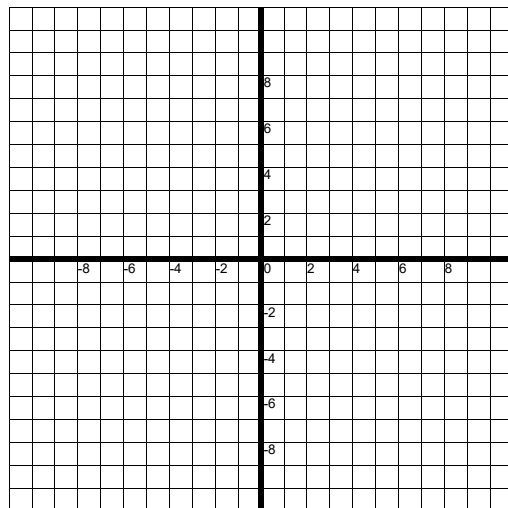
Grid A ↓

X	Y
-3	
-2	
-1	
0	
1	
2	
3	



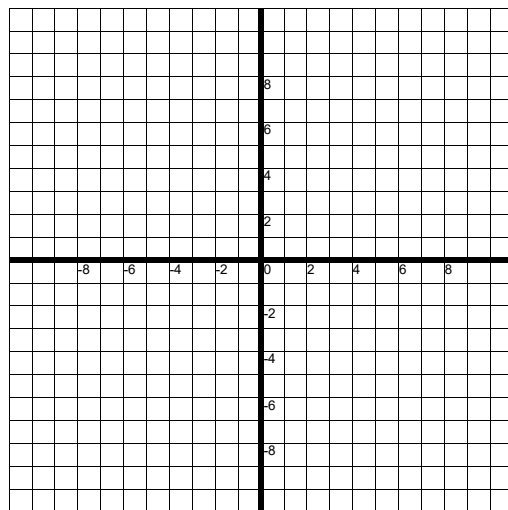
Grid B ↓

X	Y
-3	
-2	
-1	
0	
1	
2	
3	



Grid C ↓

X	Y
-3	
-2	
-1	
0	
1	
2	
3	



# Algebra II - Transformation Exploration - Pg 2

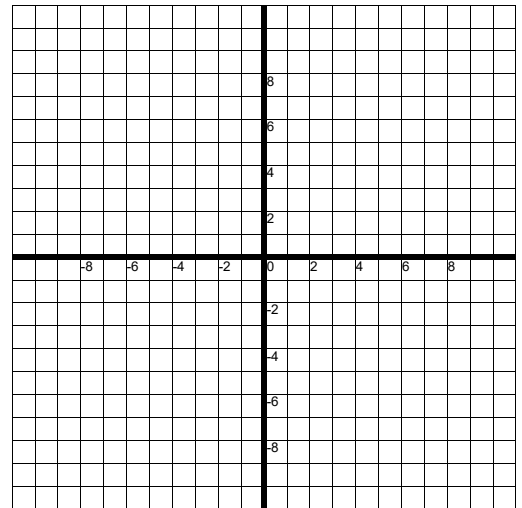
Name \_\_\_\_\_ Date \_\_\_\_\_

## TRANSLATIONS - CONT'D.

- 10) On Grid D, redraw the graph of  $y = |x|$  with a light colored pencil.
- 11) Also on Grid D, use a different color to plot the graph of  $y = |x + 4|$  using the x-values -7, -6, -5, -4, -3, -2, and -1. Again, use a straight edge to connect the points. Be sure to label both of your graphs.
- 12) How does the graph of  $y = |x + 4|$  compare with the graph of  $y = |x|$ ? Write your answer below:

X	Y
-7	
-6	
-5	
-4	
-3	
-2	
-1	

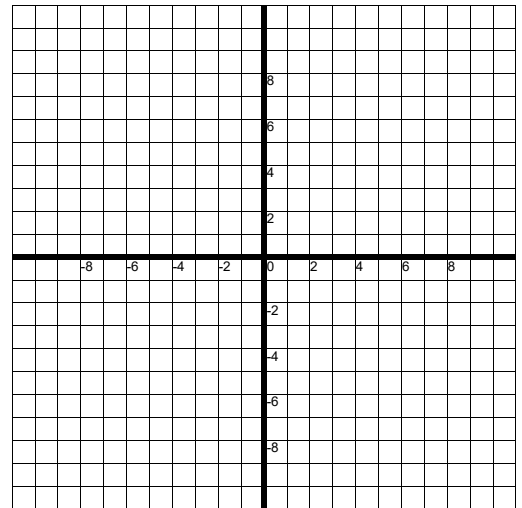
Grid D ↓



- 13) On Grid E, redraw the graph of  $y = |x|$  with a light colored pencil.
- 14) Also on Grid E, use a different color to plot the graph of  $y = |x - 5|$  using the x-values 2, 3, 4, 5, 6, 7, and 8. Again, use a straight edge to connect the points.. Be sure to label both of your graphs.
- 15) How does the graph of  $y = |x - 5|$  compare with the graph of  $y = |x|$ ? Write your answer below:

X	Y
2	
3	
4	
5	
6	
7	
8	

Grid E ↓

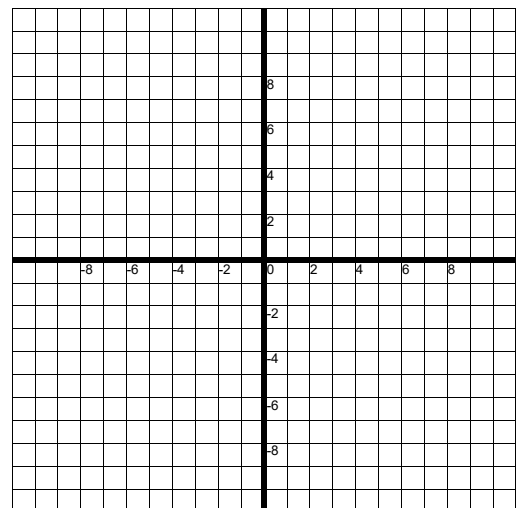


## REFLECTIONS

- 16) On Grid F, redraw the graph of  $y = |x|$  with a light colored pencil.
- 17) Also on Grid F, use a different color to plot the graph of  $y = -|x|$  using the x-values -3, -2, -1, 0, 1, 2, and 3. Again, use a straight edge to connect the points.. Be sure to label both of your graphs.
- 18) How does the graph of  $y = -|x|$  compare with the graph of  $y = |x|$ ? Write your answer below:

X	Y
-3	
-2	
-1	
0	
1	
2	
3	

Grid F ↓



# Algebra II - Transformation Exploration - Pg 3

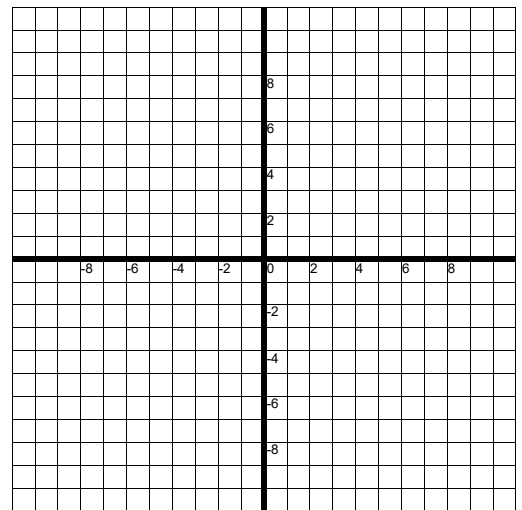
Name \_\_\_\_\_ Date \_\_\_\_\_

## VERTICAL STRETCH AND COMPRESS

- 19) On Grid G, draw the graph of  $y = |x|$  with a light colored pencil.
- 20) Also on Grid G, use a different color to plot the graph of  $y = 2|x|$  using the x-values -3, -2, -1, 0, 1, 2, and 3. Again, use a straight edge to connect the points. Be sure to label both of your graphs.
- 21) How does the graph of  $y = 2|x|$  compare with the graph of  $y = |x|$ ? Write your answer below:

X	Y
-3	
-2	
-1	
0	
1	
2	
3	

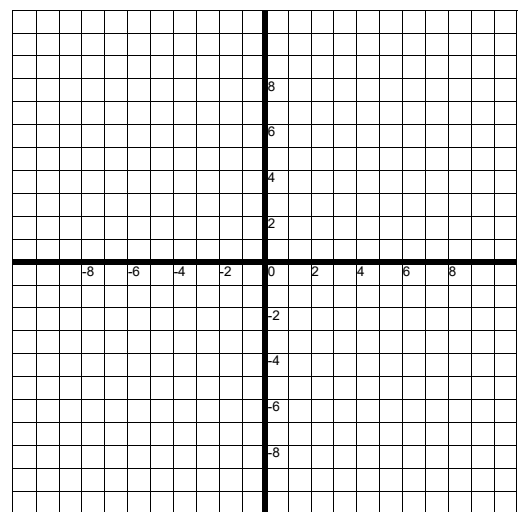
Grid G ↓



- 22) On Grid H, draw the graph of  $y = |x|$  with a light colored pencil.
- 23) Also on Grid H, use a different color to plot the graph of  $y = \frac{1}{2}|x|$  using the x-values -8, -4, -2, 0, 2, 4, and 8. Again, use a straight edge to connect the points. Be sure to label both of your graphs.
- 24) How does the graph of  $y = \frac{1}{2}|x|$  compare with the graph of  $y = |x|$ ? Write your answer below:

X	Y
-8	
-4	
-2	
0	
2	
4	
8	

Grid H ↓



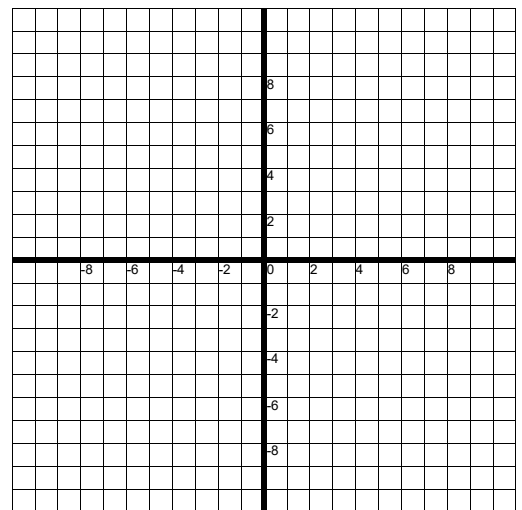
## MULTIPLE TRANSFORMATIONS

- 29) On Grid I, redraw the graph of  $y = |x|$  with a light colored pencil.
- 30) On Grid I, you will be graphing  $y = -2|x + 3| + 5$ . What do you expect to look like?

Grid I ↓

the graph

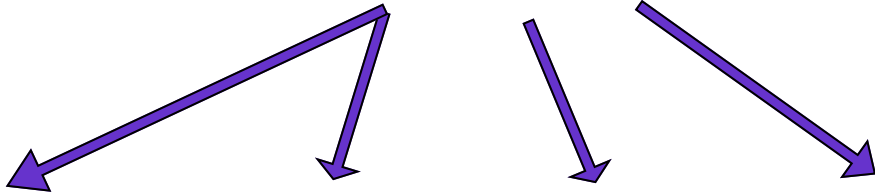
X	Y
-6	
-5	
-4	
-3	
-2	
-1	
0	



- 31) On Grid I, use a different color to plot the graph of  $y = -2|x + 3| + 5$  using the x-values -6, -5, -4, -3, -2, -1, and 0. Again, use a straight edge to connect the points.. Be sure to label both of your graphs.
- 32) Was your prediction on question 30 accurate?

## Graphing Transformation Summary

$$y = a | x - h | + k$$



What does the graph look like when the value of “a” is positive?

What happens to the graph when the value of “a” is greater than one? (Describe the graph in words)

How does the value of “h” affect the graph?

How does the value of “k” affect the graph?

What happens to the graph if the value of “a” is negative?

What happens to the graph when the value of “a” is a fraction between 0 and 1?

In the equation above, there is a negative in front of the “h”. Why do you think that is?

If “k” is positive, how does the graph shift?

What is critical to remember about the “h” value or horizontal shift of a graph?

If “k” is negative, how does the graph shift?