

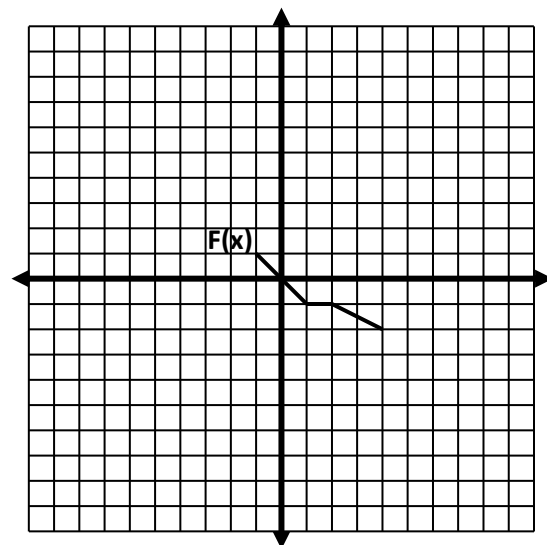
Transformations with Fred – Day 2

Today we will revisit Fred, our “parent” function, and investigate transformations other than translations.

Recall that the equation for Fred is $y = F(x)$.

Complete the chart with Fred’s characteristic points.

x	$F(x)$



I. Let’s suppose that Freddie Jr. is $y = -F(x)$

1. Complete the table.

$$y = -F(x)$$

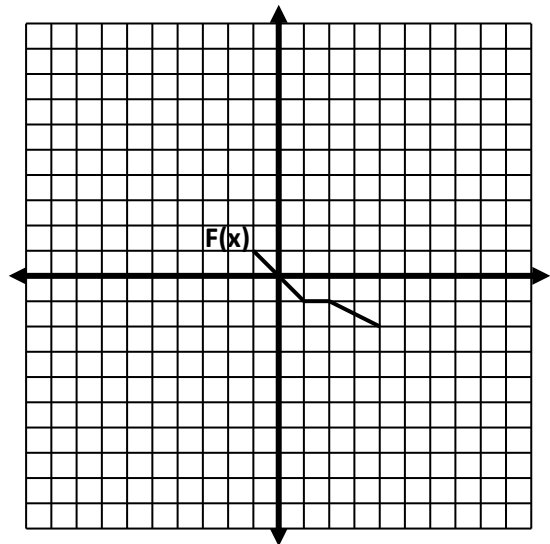
x	$F(x)$	y
-1	1	-1
1		
2		
4		

2. On the coordinate plane above, graph the 4 ordered pairs (x, y) . [Hint: The 1st point should be $(-1, -1)$.]
3. What type of transformation maps Fred, $F(x)$, to Freddie Jr., $-F(x)$? (Be specific.)
4. How did this transformation affect the x -values? (Hint: Compare the characteristic points of Fred and Freddie Jr.)
5. How did this transformation affect the y -values? (Hint: Compare the characteristic points of Fred and Freddie Jr.)
6. In $y = -F(x)$, how did the negative coefficient of “ $F(x)$ ” affect the graph of Fred? How does this relate to our study of transformations earlier this semester?

II. Now let's suppose that Freddie Jr. is $y = F(-x)$

1. Complete the table.

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



2. On the coordinate plane above, graph the 4 ordered pairs (x, y) . [Hint: The 1st point should be $(1, 1)$.]

3. What type of transformation maps Fred, $F(x)$, to Freddie Jr., $F(-x)$? (Be specific.)

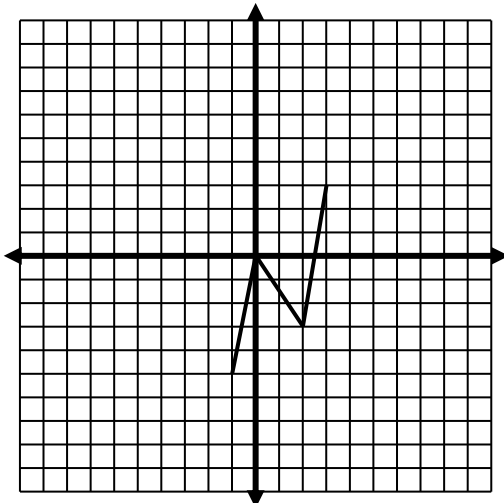
4. How did this transformation affect the x-values? (Hint: Compare the characteristic points of Fred and Freddie Jr.)

5. How did this transformation affect the y-values? (Hint: Compare the characteristic points of Fred and Freddie Jr.)

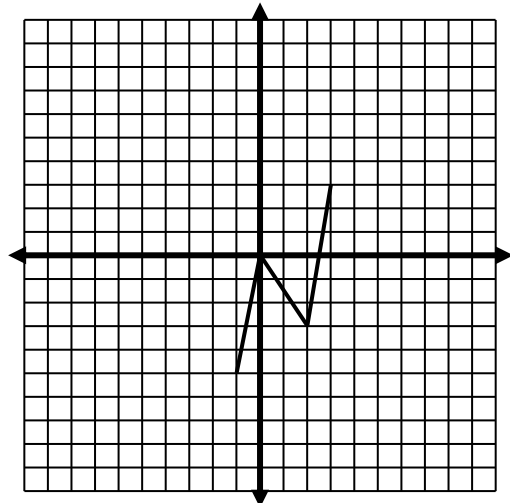
6. In $y = F(-x)$, how did the negative coefficient of "x" affect the graph of Fred? How does this relate to our study of transformations earlier this semester?

III. Checkpoint: Harry is $H(x)$ and is shown on each grid. Use Harry's characteristic points to graph Harry's children without making a table.

1. $y = H(-x)$



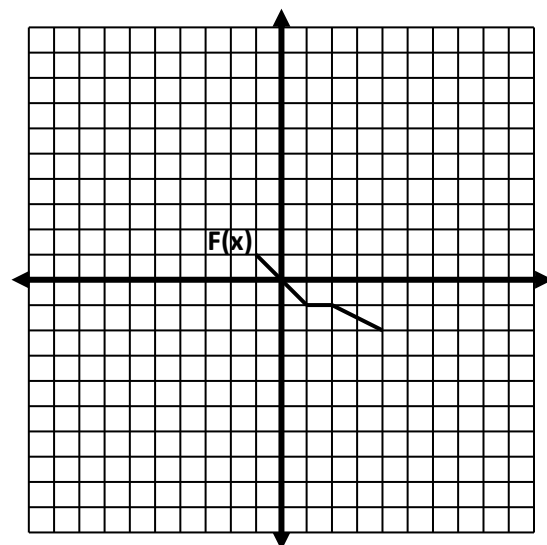
2. $y = -H(x)$



IV. Now let's return to Fred, whose equation is $y = F(x)$.

Complete the chart with Fred's characteristic points.

x	F(x)



Let's suppose that Freddie Jr. is $y = 4 F(x)$

1. Complete the table.

$$y = 4 F(x)$$

x	F(x)	y
-1		
1		
2		
4		

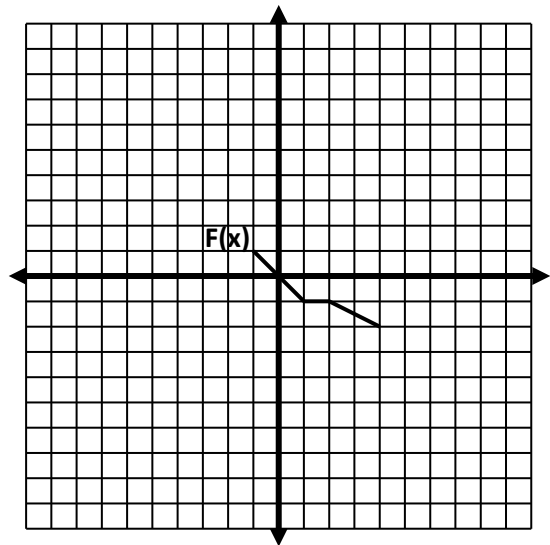
- On the coordinate plane above, graph the 4 ordered pairs (x, y) . [Hint: The 1st one should be $(-1, 4)$.]
- How did this transformation affect the x-values? (Hint: Compare the characteristic points of Fred and Freddie Jr.)
- How did this transformation affect the y-values? (Hint: Compare the characteristic points of Fred and Freddie Jr.)
- In $y = 4 F(x)$, the coefficient of "F(x)" is 4. How did that affect the graph of Fred? Is this one of the transformations we studied? If so, which one? If not, explain.

V. Now let's suppose that Freddie Jr. is $y = \frac{1}{2} F(x)$.

1. Complete the table.

$$y = \frac{1}{2} F(x)$$

x	F(x)	y
-1		
1		
2		
4		



2. On the coordinate plane above, graph the 4 ordered pairs (x, y) . [Hint: The 1st one should be $(-1, \frac{1}{2})$.]

3. How did this transformation affect the x-values? (Hint: Compare the characteristic points of Fred and Freddie Jr.)

4. How did this transformation affect the y-values? (Hint: Compare the characteristic points of Fred and Freddie Jr.)

5. In $y = \frac{1}{2} F(x)$, the coefficient of "F(x)" is $\frac{1}{2}$. How did that affect the graph of Fred? How is this different from the graph of $y = 4 F(x)$ on the previous page?

VI. Checkpoint:

1. Complete each chart below. Each chart starts with the characteristic points of Fred.

x	F(x)	3 F(x)
-1	1	
1	-1	
2	-1	
4	-2	

x	F(x)	$\frac{1}{4} F(x)$
-1	1	
1	-1	
2	-1	
4	-2	

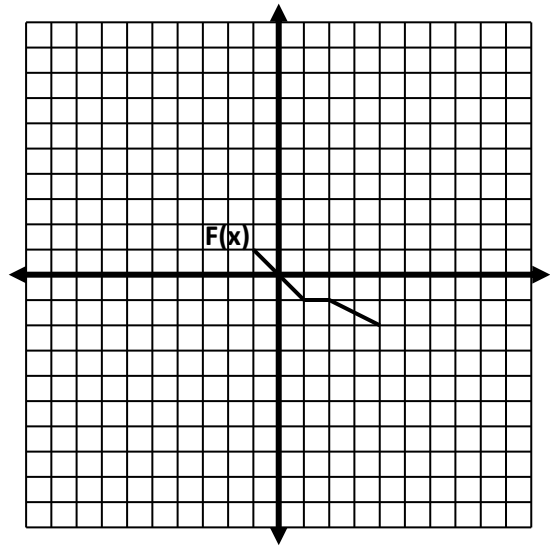
2. Compare the 2nd and 3rd columns of each chart above. The 2nd column is the y-value for Fred. Can you make a conjecture about how a coefficient changes the parent graph?

VII. Now let's suppose that Freddie Jr. is $y = -3 F(x)$.

1. Complete the table.

$y = -3 F(x)$

x	F(x)	y
-1		
1		
2		
4		



2. On the coordinate plane above, graph the 4 ordered pairs (x, y) . [Hint: The 1st one should be $(-1, -3)$.]

3. Reread the conjecture you made in #7 on the previous page. Does it hold true or do you need to refine it? If it does need some work, restate it more correctly here.

VIII. Checkpoint: Let's revisit Harry, H(x).

1. Describe the effect on Harry's graph for each of the following.

Example: $-5H(x)$ _____ Each point is reflected in the x-axis and is 5 times as far from the x-axis.

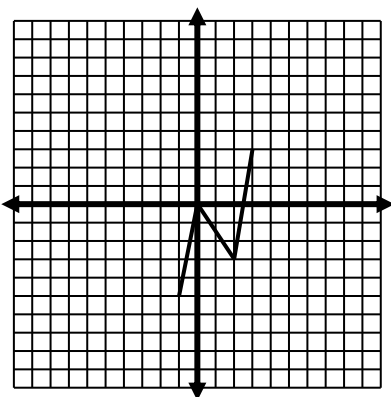
a. $3H(x)$ _____

b. $-2H(x)$ _____

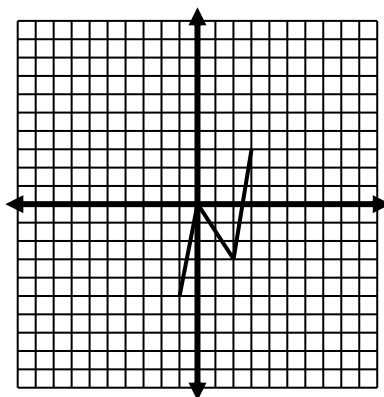
c. $\frac{1}{2}H(x)$ _____

2. Use your answers to questions 1 and 2 to help you sketch each graph without using a table.

a. $y = 3H(x)$



b. $y = -2H(x)$



c. $y = \frac{1}{2}H(x)$

