



Transformations of Functions 2

Student Activity

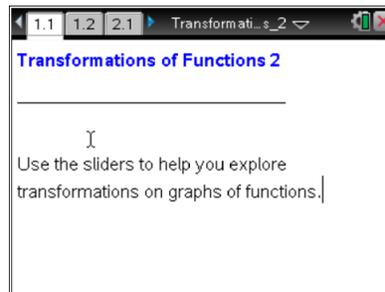


Name _____

Class _____

Open the TI-Nspire document *Transformations_of_Functions_2*.

How does the graph of $y = 2 f(x)$ compare to the graph of $y = f(x)$? This is one of the transformations that you will see as you explore how the graph of the function $y = a \cdot f(x)$ is altered as the value of a is changed.



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1. What happens to the graph of $y_2 = a \cdot f(x)$ as you change the value of a ?
2. Use the slider to change the value of a . Describe how the graph of $y_2 = a \cdot f(x)$ is different from the graph of $y_1 = f(x)$ as the value of a changes. Complete the table below.

a	Difference between $y_2 = a \cdot f(x)$ and $y_1 = f(x)$
2	
2.5	
0.5	
0.25	
-1	
-2	
-0.25	
1	

3. Based on your observations in question 2:
 - a. How do you think the graph of $y_2 = a \cdot f(x)$ would compare with $y_1 = f(x)$ for $a = 5$? Explain.



b. How do you think the graph of $y_2 = a \times f(x)$ would compare with $y_1 = f(x)$ for $a = 0.1$?

Explain.

c. How do you think the graph of $y_2 = a \times f(x)$ would compare with $y_1 = f(x)$ for $a = -5$? Explain.

4. Move the slider so that $a = 0$. What happens to the graph of $y_2 = a \times f(x)$? Why does this happen?

Move to page 2.1.

5. Find a value for a that will satisfy the given conditions:

a. The graph of $y_2 = a \times f(x)$ is *stretched* vertically compared to the graph of $y_1 = a \times f(x)$ and opens in the *same* direction as $y_1 = f(x)$.

b. The graph of $y_2 = a \times f(x)$ is vertically *compressed* compared to the graph of $y_1 = a \times f(x)$ and opens in the *opposite* direction from $y_1 = f(x)$.

6. a. If the graph of $y_1 = f(x)$ includes the point $(1, 3)$, what corresponding point would be found on the graph of $y_2 = 2 \cdot f(x)$?

b. If the graph of $y_1 = f(x)$ includes the point (x, y) , what corresponding point would be found on the graph of $y_2 = 2 \cdot f(x)$?



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- c. If the graph of $y_1 = f(x)$ includes the point $(2, 4)$, what corresponding point would be found on the graph of $y_2 = -3 \cdot f(x)$?
- d. If the graph of $y_1 = f(x)$ includes the point (x, y) , what corresponding point would be found on the graph of $y_2 = -3 \cdot f(x)$?