Lesson 19: Translating Functions

Classwork

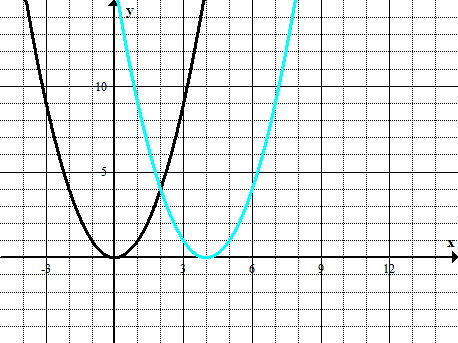
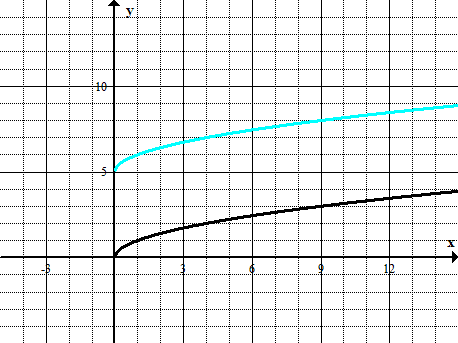
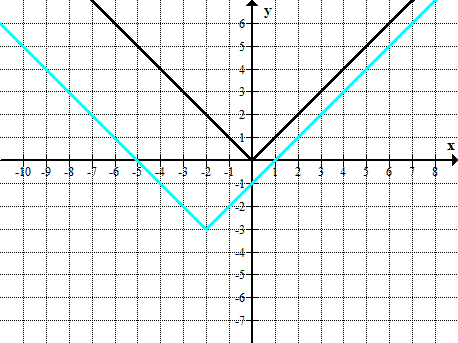
Opening Exercise

Graph each set of three functions in the same coordinate plane (on your graphing calculator or a piece of graph paper). Then, explain what similarities and differences you see among the graphs.

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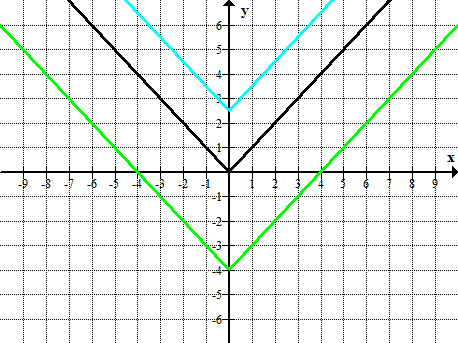
**Example**

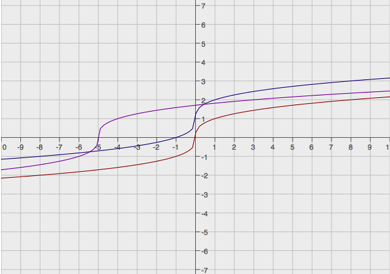
For each graph, answer the following:

* What is the parent function?
* How does the translated graph relate to the graph of the parent function?
* Write the formula for the function depicted by the translated graph.
  1. 
  2. ****
  3. 

Exercises 1–3

1. For each of the following graphs, use the formula for the parent function to write the formula of the translated function.



* 1. 

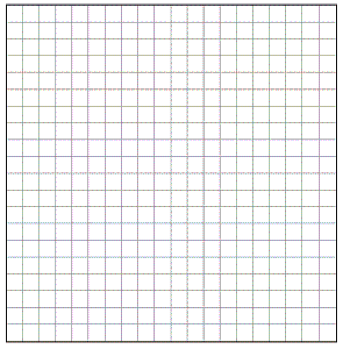
1. Below is a graph of a piecewise function whose domain is . Sketch the graphs of the given functions on the same coordinate plane. Label your graphs correctly.



1. Match the correct equation and description of the function with the given graphs.

|  |  |  |
| --- | --- | --- |
| Graphs | Equation | Description |
| Equation \_\_\_\_\_\_\_\_\_ Description \_\_\_\_\_\_\_\_\_\_\_ | E1.  E2.  E3.  E4. | D1. The graph of the parent function is translated down units and left units.  D2. The graph of the function does not have an -intercept.  D3. The coordinate of the -intercept is , and both -intercepts are positive.  D4. The graph of the function has only one -intercept. |
| Equation \_\_\_\_\_\_\_\_\_ Description \_\_\_\_\_\_\_\_\_\_\_ |
| Equation \_\_\_\_\_\_\_\_\_ Description \_\_\_\_\_\_\_\_\_\_\_ |
| Equation \_\_\_\_\_\_\_\_\_ Description \_\_\_\_\_\_\_\_\_\_\_ |

Problem Set

1. Graph the functions in the same coordinate plane. Do not use a graphing calculator.
2. Write a function that translates the graph of the parent function down units and right units.
3. How would the graph of be affected if the function were transformed to ?
4. Below is a graph of a piecewise function whose domain is the interval . Sketch the graph of the given functions below. Label your graphs correctly.

(Be careful, this one might be a challenge.)



1. Study the graphs below. Identify the parent function and the transformations of that function depicted by the second graph. Then, write the formula for the transformed function.

