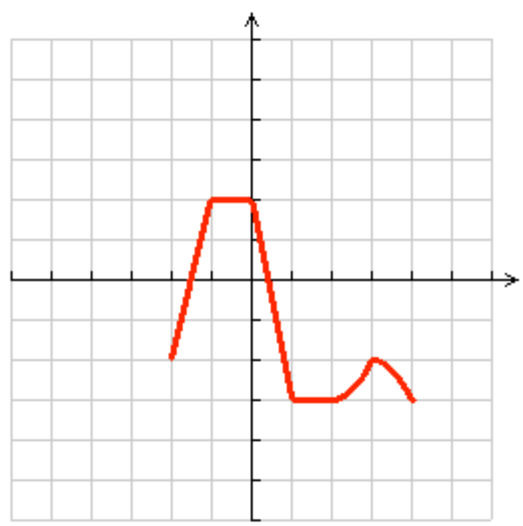
TASK 1.2.2: DOMAINS

Solutions

1. Look back at Task 1.2.1. Notice that input values, the x-values, varied for some of the exercises. Function values are given for the x-values: –2, –1, 0, 1, 2, 3. But, for example, Exercise 1, $y = f(x+2)$, provides the x-values of –4, –3, –2, –1, 0, 1, 2 and Exercise 2, $y = f(x-2)$, provides the x-values of 0, 1, 2, 3, 4, 5, 6. Explain why this varied. Could we have used the x-values -2 and -1 in Exercise 2? Explain why or why not. Use examples in your explanations.
   This question is linked to the opening discussion for Task 1.2.1 about key features and important points on graphs. However, it is important for the discussion of appropriate domain of the function and its transformation to come out in this explanation.

2. Design a function g that is constructed in a similar manner as the function f from Task 1.2.1. Show a table and graph that would allow your students to fill in the function values and graph the transformation $g(x+4)$.
   Answers vary.

Given: Graph of g



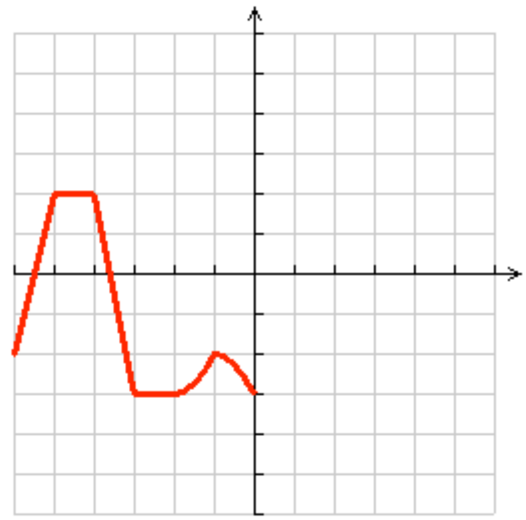
Some values for g

$g(-2) = -2$
$g(-1) = 2$
$g(0) = 2$
$g(1) = -3$
$g(2) = -3$
$g(3) = -2$
$g(4) = -3$

Complete the table and sketch the graph of:

$g(x+4)$

x	y
-6	-2
-5	2
-4	2
-3	-3
-2	-3
-1	-2
0	-3



Math Notes:
Creating examples of functions or designing functions that fit certain criteria is an important skill to develop. In this context, we reinforce the concept of domain for a function and also begin develop the mathematical thinking necessary to determine which transformations produce functions with a different domain from the parent function (and also which produce functions with a different domain but the same range, etc.).

Teaching Notes:
Provide a transparency with axes and a grid. Have each group trace one of their functions and its transformation on the transparency. Each group will present this to the class.

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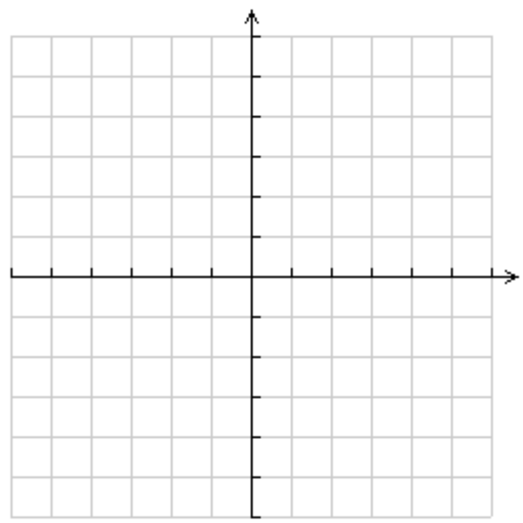

Some values for g

$g(\ ) =$
$g(\ ) =$
$g(\ ) =$
$g(\ ) =$
$g(\ ) =$
$g(\ ) =$
$g(\ ) =$

Complete the table and sketch $g(x+4)$ on the graph above.

x	y