LESSON 2.2 Skills Practice

Name _____ Date _____

Function Sense
Translating Functions

2

Vocabulary

Complete each sentence with the correct term from the word bank.

transformation	reference point
translation	argument of a function

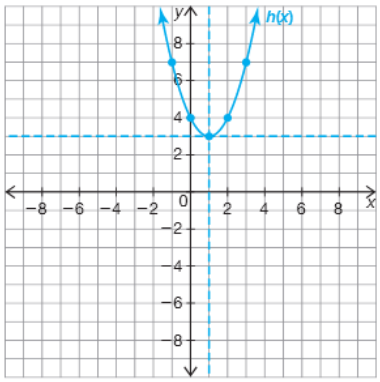
1. A(n) _____ is one of a set of key points that help identify the basic function.
2. The mapping, or movement, of all the points of a figure in a plane according to a common operation is called a(n) _____.
3. The _____ is the variable, term, or expression on which the function operates.
4. A(n) _____ is a type of transformation that shifts an entire figure or graph the same distance and direction.

Problem Set

Given $f(x) = x^2$, complete the table and graph $h(x)$.

1. $h(x) = (x - 1)^2 + 3$

Reference Points on $f(x)$	→	Corresponding Points on $h(x)$
(0, 0)	→	(1, 3)
(1, 1)	→	(2, 4)
(2, 4)	→	(3, 7)



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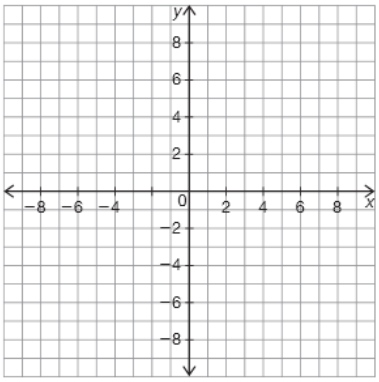
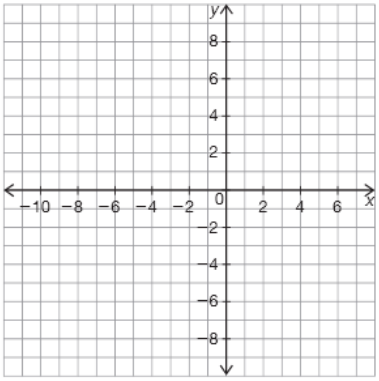
2. $h(x) = (x + 2)^2 - 1$

Reference Points of $f(x)$	→	Corresponding Points on $h(x)$
(0, 0)	→	
(1, 1)	→	
(2, 4)	→	



3. $h(x) = (x + 7)^2$

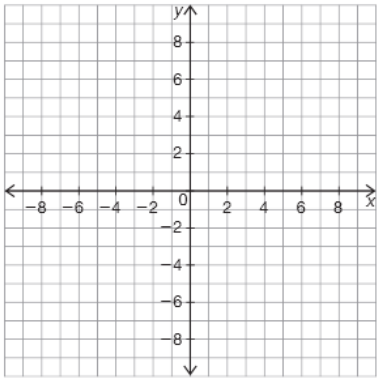
Reference Points of $f(x)$	→	Corresponding Points on $h(x)$
(0, 0)	→	
(1, 1)	→	
(2, 4)	→	



Name _____ Date _____

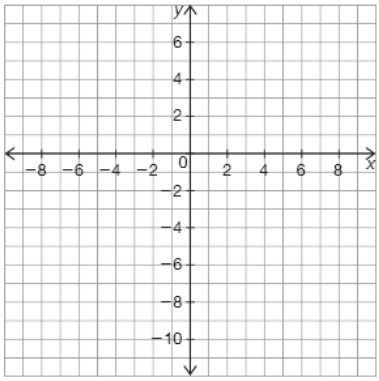
4. $h(x) = (x - 3)^2 + 4$

Reference Points of $f(x)$	→	Corresponding Points on $h(x)$
(0, 0)	→	
(1, 1)	→	
(2, 4)	→	



5. $h(x) = x^2 - 9$

Reference Points of $f(x)$	→	Corresponding Points on $h(x)$
(0, 0)	→	
(1, 1)	→	
(2, 4)	→	



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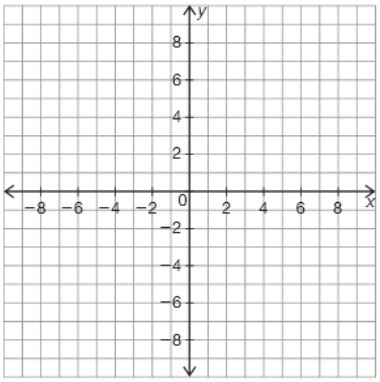
6. $h(x) = (x + 4)^2 - 4$

Reference Points of $f(x)$	→	Corresponding Points on $h(x)$
(0, 0)	→	
(1, 1)	→	
(2, 4)	→	



Each given function is in transformational function form $g(x) = Af(B(x - C)) + D$, where $f(x) = x^2$. Identify the values of C and D for the given function. Then, describe how the vertex of the given function compares to the vertex of $f(x)$.

7. $g(x) = f(x - 4) + 12$

The C–value is 4 and the D–value is 12, so the vertex will be shifted 4 units to the right and 12 units up to (4, 12).

8. $g(x) = f(x + 8) - 9$

9. $g(x) = f(x - 5) - 11$

10. $g(x) = f(x - 6) + 10$

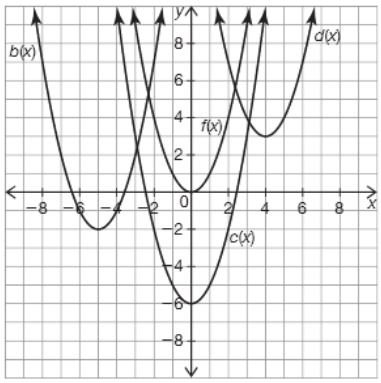
Name _____ Date _____

11. $g(x) = f(x + 2) + 3$

2

12. $g(x) = f(x + 4) - 2$

Analyze the graphs of $b(x)$, $c(x)$, $d(x)$, and $f(x)$. Write each function in terms of the indicated function.



13. Write $b(x)$ in terms of $f(x)$.
$b(x) = f(x + 5) - 2$

14. Write $c(x)$ in terms of $f(x)$.

15. Write $d(x)$ in terms of $f(x)$.

16. Write $d(x)$ in terms of $b(x)$.

17. Write $c(x)$ in terms of $b(x)$.

18. Write $b(x)$ in terms of $c(x)$.