NAME _____

DATE _____

Module 9   Using Functions
Lesson 1   Defining Relations and Functions

independent practice

Find the domain and range of each relation.

1. Q = {(3, 4), (–4, 1), (2, 5), (–4, 1), (0, 0)}

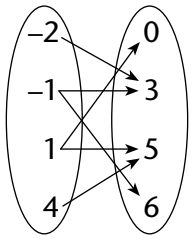**2.** F = {(–4, 0), (–3, –2), (1, 0), (2, 1), (1, 2)}

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3.

x	y
–2	3
–1	1
3	3
4	–2

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4.
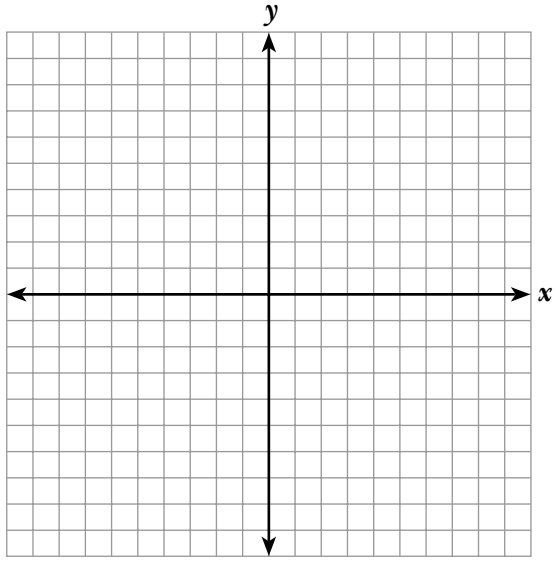
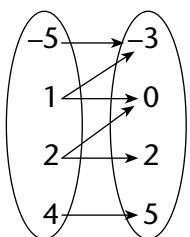| x	y
–5	5
0	4
0	5
1	4

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Graph on the coordinate plane the relation represented by each mapping diagram. Then, name the domain and range of each relation.

5.

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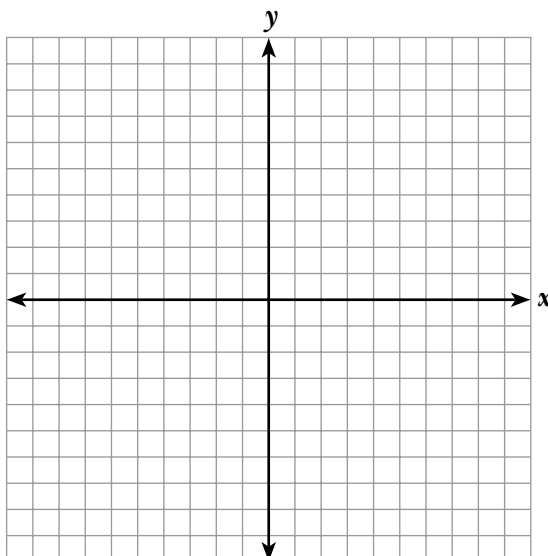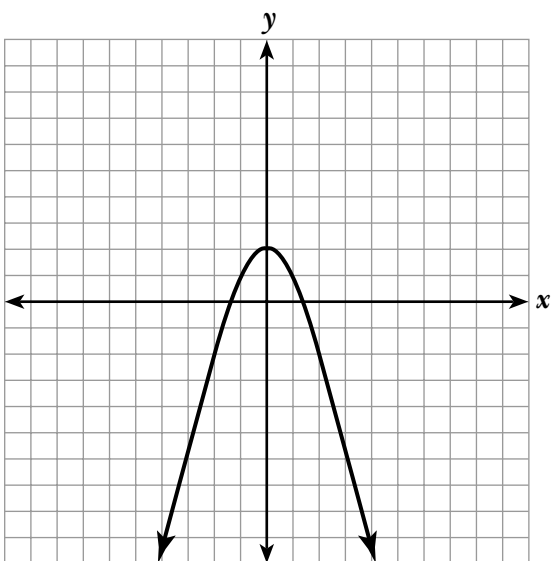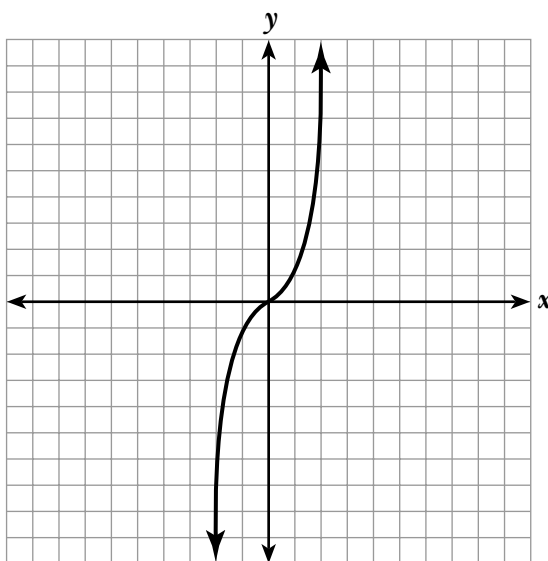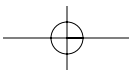_____

6.

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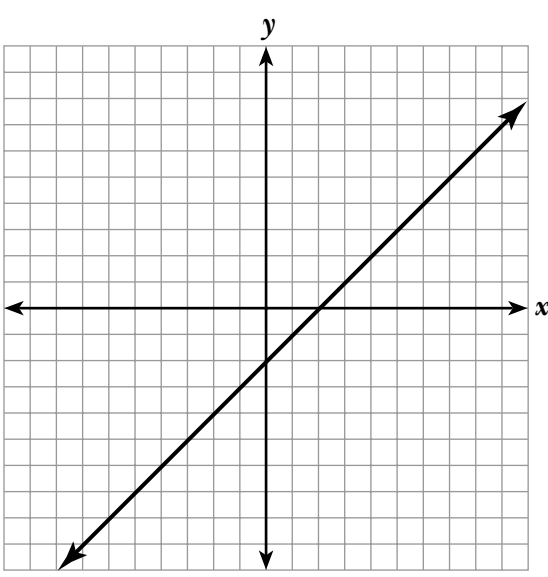**Find the domain and range of each function.**

7. $y = -x^2 + 2$
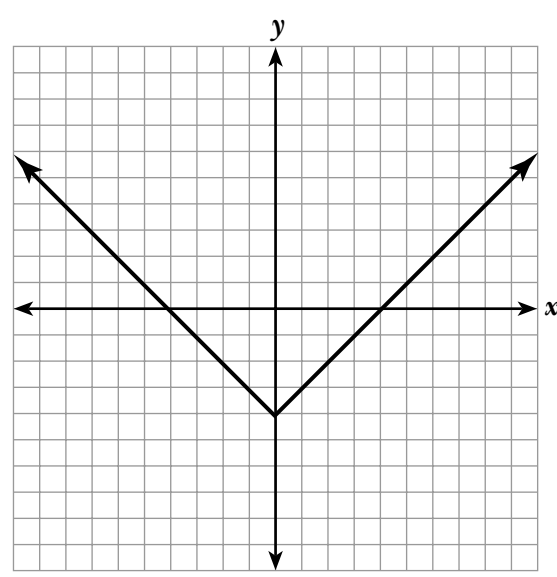
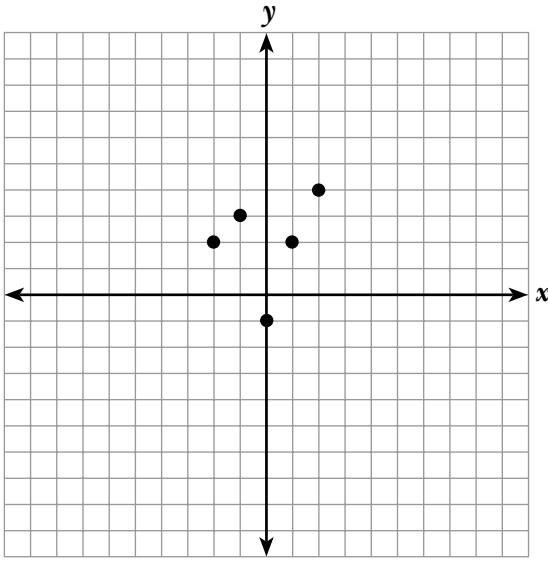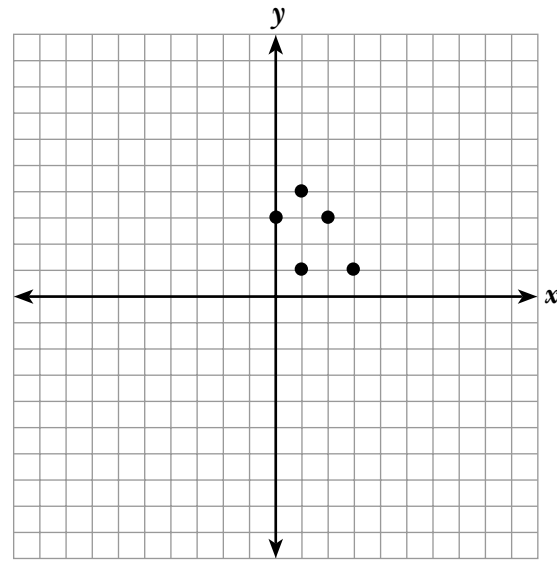**8.** $y = x^3$

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9. $y = x - 2$

10. $y = |x| - 4$

Determine whether each graph represents a function. Explain.

11.

12.

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13.

14.

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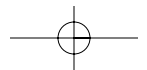
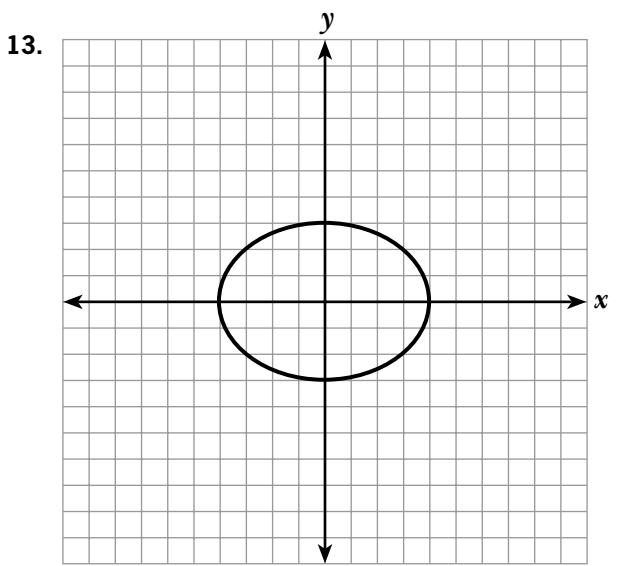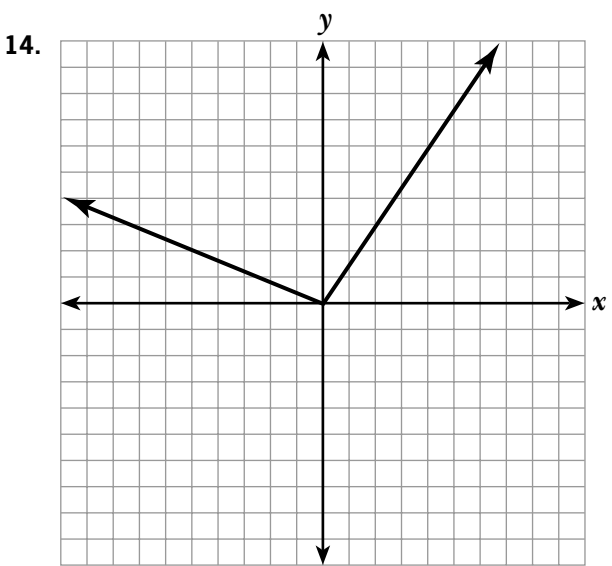## Journal

1. In the lesson introduction, Frogan compared the oven to a function machine. What did he mean? After studying functions, do you agree with Mr. Frogan? Explain.
2. Explain how you can tell whether a relation represented by a mapping diagram is a function.
3. Suppose that a function has n elements in its domain. What do you know about the number of elements in the range? Explain.
4. Explain the theory behind the vertical line test. Why is the test effective in determining whether a graph represents a function?
5. Is every line a function? Explain.

Cumulative Review

Evaluate each expression for the given value(s) of the variable(s).

1. $a - 9$ if $a = 3$ _____

2. $4c - 12$ if $c = -4$ _____

3. $r^2 - 4r$ if $r = -5$ _____

4. $a^2 - 3b$ if $a = 2$ and $b = -4$ _____

5. $\frac{n}{4} + 3n^2 - \frac{1}{4}n$ if $n = 5$ _____

6. $\sqrt{p - 4} - p$ if $p = 40$ _____

7. $\sqrt[3]{3t} - \sqrt{t}$ if $t = 9$ _____

8. $4rs - (r + s)^2$ if $r = -1$ and $s = 3$ _____

9. $-2|h - 7| + h^3j - 3j$ if $h = -2$ and $j = -3$

10. $gh - g^2h - 8h^2$ if $g = -5$ and $h = -4$

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