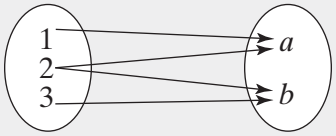
4-2 Introduction to Functions

Name _____ Date _____

The mapping diagram represents a set of ordered pairs.



Determine if this relation is also a function.

Think

A function is a relation that pairs each domain value to exactly one range value.

This relation is not a function; domain value 2 corresponds to two range values: a and b.

If you know an input value for a function, you can find the corresponding output value.

If $f(x) = 9x - 5$, find $f(-3)$.

$f(-3) = 9(-3) - 5$ ← Substitute -3 for x.

$= -27 - 5$ ← Simplify.

$= -32$

The ordered pair $(-3, -32)$ satisfies $f(x) = 9x - 5$.

Write the domain and range of each relation and tell whether the relation is a function.

1.

x	y
-4	-16
-2	-4
0	0
2	-4
4	-16

Domain: {−4, −2, 0, 2, 4}
Range: {−16, −4, 0, −4, −16}
function; every input value has exactly one output value.

2.

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

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3.

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

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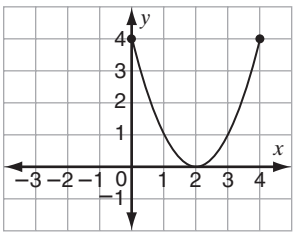
4.



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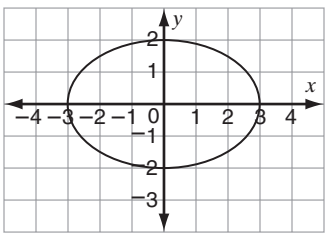

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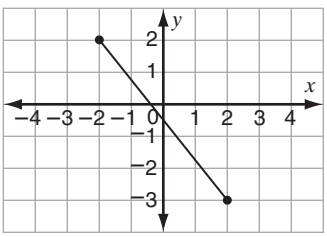

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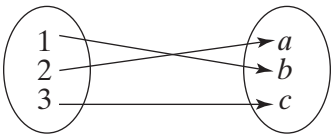

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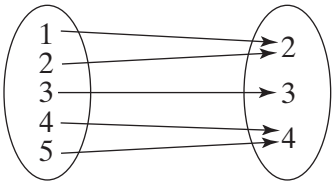
8.



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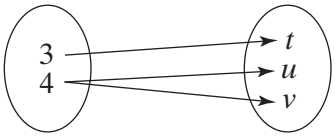
9.



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Circle the best answer.

10. Given the relation $P = \{(-3, 4), (-2, 5), (2, 2), (x, 5)\}$, which replacement for x makes this relation a function?

a. -3 **b.** -2

c. 2 **d.** 3

11. Given the relation $G = \{(-1, 3), (x, 4), (3, 7), (4, 8)\}$, which replacement for x makes this relation a function?

a. -1 **b.** 0

c. 3 **d.** 4

12. The relation $K = \{(-2, 4), (-1, -2), (-1, 5), (0, 1), (1, 3)\}$ is *not* a function. Omitting which ordered pair will make the resulting set a function?

a. $(-2, 4)$ **b.** $(-1, -2)$

c. $(0, 1)$ **d.** $(1, 3)$

13. The relation $W = \{(-1, 3), (0, 2), (1, 1), (2, 2), (2, 3)\}$ is *not* a function. Omitting which ordered pair will make the resulting set a function?

a. $(-1, 3)$ **b.** $(0, 2)$

c. $(1, 1)$ **d.** $(2, 3)$

Evaluate each expression, given $f(x) = 5x - 2$, $g(x) = x^2 + 3x - 2$, and $h(x) = \sqrt{x-1}$.

14. $f(3) + g(2)$

$f(3) = 5(3) - 2 = 13$
$g(2) = (2)^2 + 3(2) - 2 = 8$
$f(3) + g(2) = 13 + 8 = 21$
21

15. $f(-2) + h(1)$

16. $4[f(7) - h(26)]$

17. $5[f(9) - h(37)]$

18. $\dfrac{g(-4) - f(-3)}{h(50)}$

19. $\dfrac{g(-3) - f(-4)}{h(65)}$

Problem Solving

20. The rule for a relation is $y = (x + 1)^2$. The domain is $\{-2, -1, 0, 1, 2, 3\}$. Is the relation a function?

21. In a relation, each domain value is doubled to form the corresponding range value. Is this relation a function? Explain.

TEST PREPARATION

22. Which relation is a function?

A. $\{(-2, 3), (-1, 4), (0, 5), (0, 6), (1, 7)\}$

B. $\{(-1, 5), (0, 5), (1, 5), (2, 5), (3, 5)\}$

C. $\{(-5, -5), (-5, -4), (-5, 1), (-5, 2), (-5, 3)\}$

D. $\{(-2, 1), (-2, 0), (1, 0), (1, 1), (1, -3)\}$