

GOLD EDITION

PRACTICE COACH PLUS



Mathematics

8



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Introduction to Functions



Coached Instruction



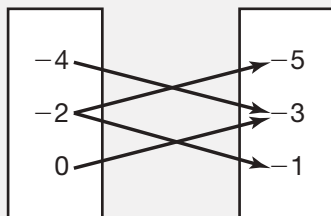
ERROR ANALYSIS

- Compare Liana's and Josie's methods of solving the problem below.

Which domain-range diagram represents a function?

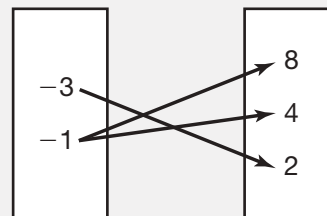
A. Domain

Range



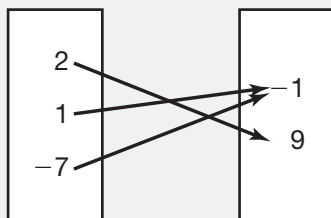
C. Domain

Range



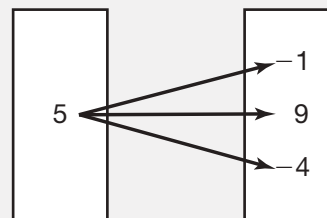
B. Domain

Range



D. Domain

Range



LIANA'S METHOD

I eliminated the choices that had more than one arrow coming from a number in the domain. The only choice that was left was Choice B. So, I think that Choice B is correct.

JOSIE'S METHOD

I eliminated Choices A, B, and C because they each had 2 arrows going to the same number in the range. Only Choice D has only one arrow pointing to each number in the range. So, I think that Choice D is correct.

Who is correct?

Liana is correct. In a function, no element of the domain is paired with more than one element of the range. So, in a domain-range diagram of a function, no number in the domain would have more than one arrow coming from it.

DISCUSS

What was Josie's error?

How can you avoid making the same error?

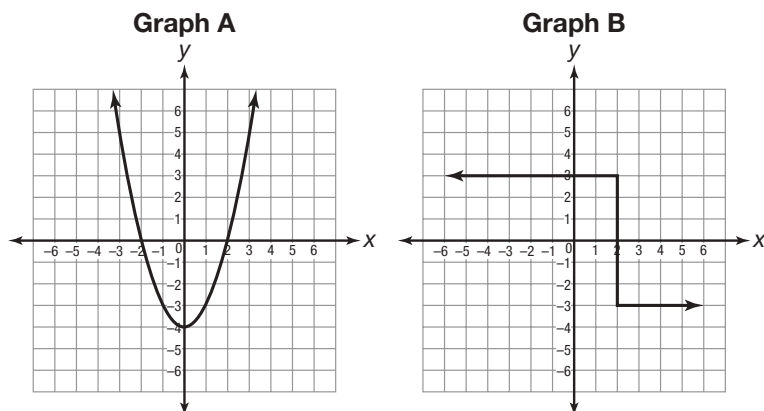
**APPLY**

Marcus thinks that the input-output table below represents a function. Is he correct? Explain your reasoning.

Input	-1	-5	7	-1
Output	2	7	-3	4

► Compare Linh's and Jen's methods of solving the problem below.

Which graph shows a function?



LINH'S METHOD

I used the vertical line test for Graph A.

There are no lines that would intersect the graph at more than one point.

Graph A is a function.

I used the vertical line test for Graph B.

A line at $x = 2$ intersects the graph at more than one point.

Graph B is not a function.

JEN'S METHOD

I made tables to show the x - and y -values of each graph.

Graph A

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

Every x -value has exactly one y -value. Graph A represents a function.

Graph B

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

There is more than one y -value for the x -value of 2. Graph B does not represent a function.

DISCUSS

How are Linh's and Jen's methods similar?

Why is a vertical line used to test rather than a horizontal line?

**APPLY**

Look at the relation shown below.

$(-2, -1)$

$(-1, 4)$

$(0, 0)$

$(-2, 4)$

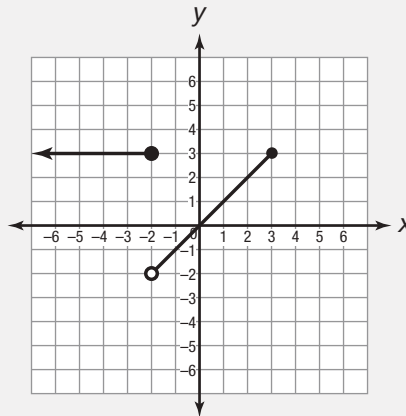
Is the relation a function? Explain your answer.



ERROR ANALYSIS

- Analyze DeShawn's method for solving the problem below.

Consider the graph below.



Does the graph represent a function? If not, what point or points would you need to remove to make it a function?

- A. It is a function.
- B. It is not a function. You need to remove $(3, 3)$.
- C. It is not a function. You need to remove both $(-2, 2)$ and $(-2, 3)$.
- D. It is not a function. You need to remove both $(3, 3)$ and $(-2, 3)$.

DeShawn made a mistake solving the problem.

DESHAWN'S METHOD

Since $(3, 3)$ and $(-2, 3)$ line up with each other, you need to remove both of these points for the graph to be a function.

I think Choice D is the correct answer.

DISCUSS

What is wrong with DeShawn's reasoning?

What does the open circle at the point $(-2, -2)$ represent?



APPLY

Where did DeShawn make his mistake?

Correct the mistake and solve the problem. Explain your thinking.

Lesson Practice | Part 1

Choose the correct answer.

1. The table shows that the total amount charged, in dollars, by a hot dog vendor is a function of the number of hot dogs purchased.

Vendor Charges

Number of Hot Dogs, x	Total Charge, y
1	\$2
2	\$4
3	\$6
4	\$8
5	\$10

What is the range of the function?

- A. 5, 10
B. 1, 2, 3, 4, 5
C. 2, 4, 6, 8, 10
D. 1, 2, 3, 4, 5, 6, 8, 10
2. Which set of ordered pairs represents a function?
- A. $(-2, 1), (0, 1), (1, -2), (3, 4)$
B. $(-1, 5), (-2, 3), (-2, 1), (-3, -1)$
C. $(12, 36), (9, 27), (-6, 30), (9, 18)$
D. $(3, 17), (-2, 11), (1, 8), (3, 5)$

3. Which table does **not** represent a function?

A.

x	7	8	8	9	10
y	7	14	21	28	35

B.

x	-2	-1	0	1	2
y	-8	-1	0	1	8

C.

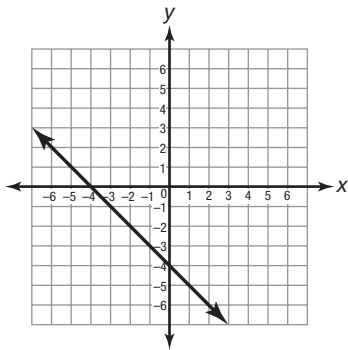
x	-8	-4	0	4	8
y	2	0	-1	-3	-5

D.

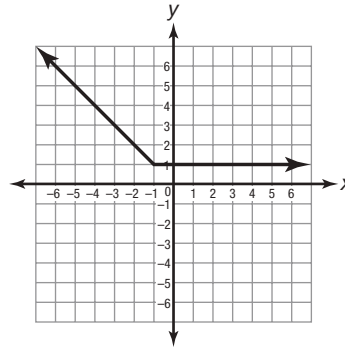
x	-10	-5	0	5	10
y	5	5	5	5	5

4. Which graph does **not** represent a function?

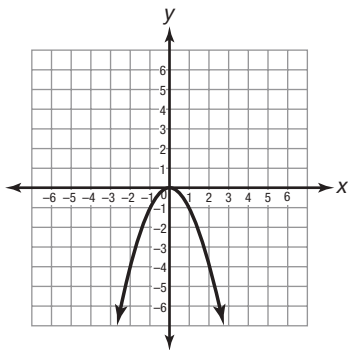
A.



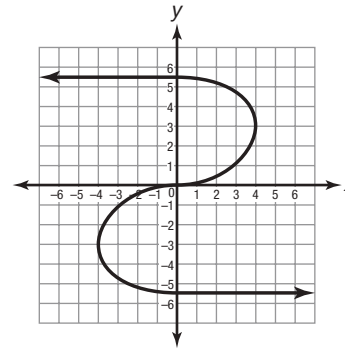
C.



B.



D.



5. The table below shows a relation.

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

A. Identify the domain and range for the relation above. Then list the domain and range in the boxes below and create a mapping diagram for this relation.

Domain

Range

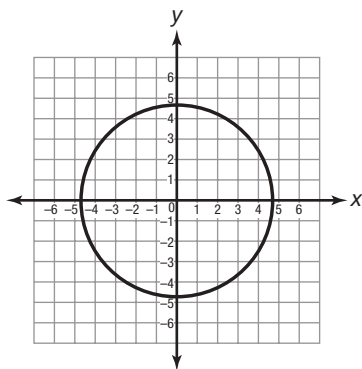
B. Is the relation also a function? Use your mapping diagram to explain your answer.

Lesson Practice | Part 2

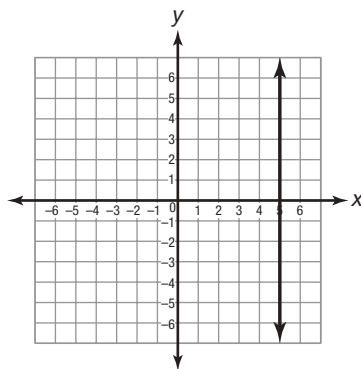
Choose the correct answer.

1. Which graph is a function?

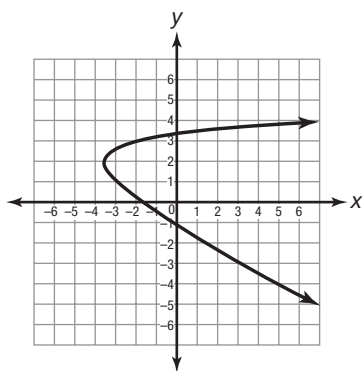
A.



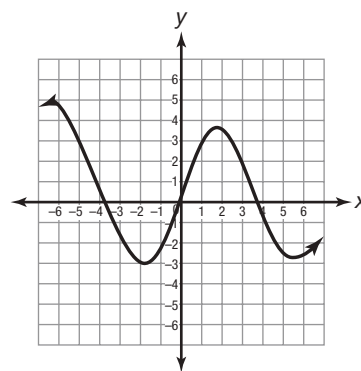
C.



B.



D.



2. The table below is a function. Which number could n **not** represent?

x	y
-4	3
-1	0
n	-2
5	-9

- A. -4
- B. 2
- C. 3
- D. 7

3. Which is **not** true of a function?

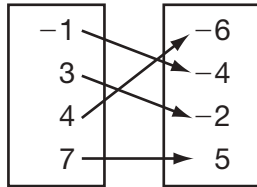
- A. A function assigns to each input exactly one output.
- B. A function is a relation.
- C. Two different input values can have the same output value.
- D. An input value can have more than one output value.

4. Two functions are shown.

Function A

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

Function B



Which statement about the functions is true?

- A. They have different domains, but the same range.
- B. They have the same domain, but different ranges.
- C. They have the same domain and range.
- D. They have different domains and ranges.

5. The table below shows the price for the number of copies made at a printing store.

Number of Copies	25	50	100	200
Cost	\$1.25	\$2.50	\$5.00	\$10.00

Which statement is true?

- A. The relation is a function with a constant change.
- B. The relation is a function, but the change is not constant.
- C. The domain is the number of copies and the range is the cost.
- D. The relation is not a function.

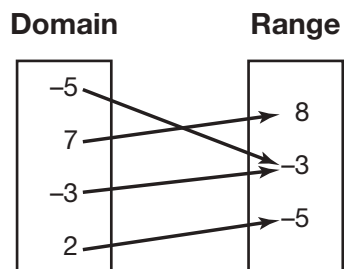
6. The table below shows how long it took Tamara to swim different distances.

Time (in minutes) (x)	Distance (in meters) (y)
0.5	50
1.25	100
2.0	200
2.0	225
2.5	300

- A. List the domain and range values.

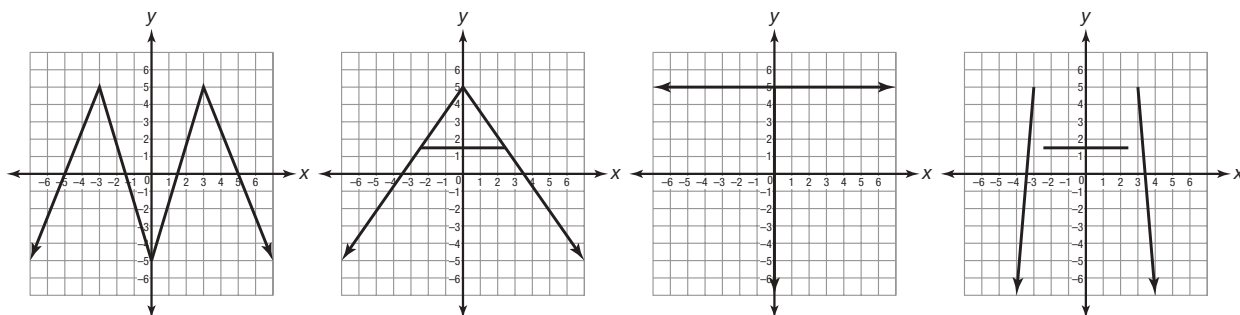
- B. Is the relation a function? Explain. Use the table to support your argument.

7. Examine the domain-range diagram.



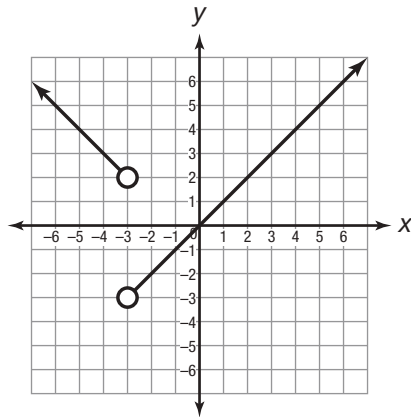
Is the relation a function? Explain your reasoning.

8. Javier uses the graphs shown to make a banner for the math club.



He wants to use yellow paper for functions and orange paper for relations that are not functions. What color paper should he use for each letter? Explain your reasoning.

9. The graph represents a relation.



Does it also represent a function? Explain your answer.

Julian adds a point at $(-3, 0)$ to the relation. Does the new relation represent a function? Explain your answer.