

Function Matchup

Evaluate, compare, and model function relationships.

GRADE 8 • 8.FGR.5

8.FGR.5 "Describe the properties of functions to define, evaluate, and compare relationships, and use functions and graphs of functions to model and explain real phenomena."

NAME _____

DATE _____

FUNCTION MOVES

A function gives exactly one output for each input. To evaluate a function, replace x with the given input and simplify. To compare functions, use the same input or find when their outputs are equal.

WORKED EXAMPLE

For $f(x) = 11x + 13$, find $f(6)$.

1. Replace x with 6: $f(6) = 11(6) + 13$.
2. Multiply: $f(6) = 66 + 13$.
3. Add: $f(6) = 79$.

Answer: $f(6) = 79$

PRACTICE 6 problems

- 1** For $g(x) = 2x + 9$, find $g(8)$.

ANSWER _____

- 2** A function follows $y = 4x - 3$. Find x when $y = 29$.

ANSWER _____

- 3** Function f has rule $f(x) = 5x$. Function g has rule $g(x) = 2x + 18$. Which function has the greater output when $x = 9$? How much greater is it?

ANSWER _____

- 4** A table has inputs 0, 2, and 4 with outputs 8, 16, and 24. Write a rule for the function.

ANSWER _____

- 5** Is the relation $\{(1, 8), (2, 10), (1, 12)\}$ a function? Explain.

ANSWER _____

- 6** For $h(x) = -2x + 20$, find $h(9)$.

ANSWER _____

APPLY IT Show your work

- 1** A tablet battery is at 92%. It loses 7 percentage points for each hour of video playback. Write a function $B(x)$ for the battery percentage after x hours. Then find the battery percentage after 8 hours.

WORK SPACE

ANSWER _____

- 2** The art club starts with \$24 and raises \$4 each day. The robotics club starts with \$8 and raises \$8 each day. After how many days will the clubs have the same amount? What will that amount be?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Function A is $y = 3x + 14$. Function B is $y = 5x - 2$. At what value of x are the outputs equal? What is the common output? Then state which function has the greater output when x is less than 8.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	For $g(x) = 2x + 9$, find $g(8)$.	$g(8) = 25$
2	A function follows $y = 4x - 3$. Find x when $y = 29$.	$x = 8$
3	Function f has rule $f(x) = 5x$. Function g has rule $g(x) = 2x + 18$. Which function has the greater output when $x = 9$? How much greater is it?	$f(9) = 45$ and $g(9) = 36$, so f has the greater output by 9.
4	A table has inputs 0, 2, and 4 with outputs 8, 16, and 24. Write a rule for the function.	$y = 4x + 8$
5	Is the relation $\{(1, 8), (2, 10), (1, 12)\}$ a function? Explain.	No. The input 1 has two different outputs, 8 and 12.
6	For $h(x) = -2x + 20$, find $h(9)$.	$h(9) = 2$

PART 2 • APPLY IT

- $B(x) = 92 - 7x$; $B(8) = 36\%$, so the battery is at 36%.** Start with 92 and subtract 7 for each hour, so $B(x) = 92 - 7x$. Substitute 8 for x to get $92 - 56 = 36$.
- After 4 days, both clubs will have \$40.** Set the amounts equal: $24 + 4x = 8 + 8x$. Solving gives $x = 4$, and either expression gives \$40.

CHALLENGE

The outputs are equal when $x = 8$, and both outputs are 38. When x is less than 8, Function A has the greater output.

Accept equivalent function notation, such as $B(x)$ or y , when the rule is correct. For comparison items, accept correct reasoning stated in words or shown with calculations.