LESSON MAKER PRO

Function Matchup

Model linear relationships with equations.

GRADE 8 · 8.F.B

CCSS.Math.Content.8.F.B "Use functions to model relationships between quantities."

NAME _____ DATE _____

BUILD THE RULE

A linear function can be written y = mx + b. The rate of change, m, tells how much y changes for each 1 increase in x. The initial value, b, is the value of y when x = 0.

WORKED EXAMPLE

Write a rule for the relationship in the table.

INPUT AND OUTPUT

x	y
1	8
2	11
3	14

1. From x = 1 to x = 2, y increases by 3, so m = 3.
2. Extend the pattern back to x = 0. The output is 5, so b = 5.
3. Write y = 3x + 5.

Answer: y = 3x + 5

PRACTICE 5 problems

1 For y = 4x + 6, find y when x = 7.

ANSWER _____

2 A linear function has a rate of change of -4 and an initial value of 10. Write its rule.

ANSWER _____

3 For y = -6x + 13, state the rate of change and the initial value.

ANSWER _____

4 For y = 9x - 4, find y when x = 12.

ANSWER _____

5 A linear relationship passes through (0, 16) and (4, 44). Write its rule.

ANSWER _____

APPLY IT Show your work

1 A game tournament charges a $17 entry fee plus $4 for each extra game. Let x be the number of extra games and y be the total cost. Write a rule, then find the cost for 9 extra games.

WORK SPACE

ANSWER _____

2 A skateboard rental costs $12 to unlock plus $7 per hour. Let x be the hours rented and y be the total cost. Write a rule, then find the cost for 4 hours.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Plan A costs y = 9x + 20 dollars. Plan B costs y = 13x + 4 dollars. At what number of months do the plans cost the same? Which plan costs less before that month and after that month? Explain using the rates and starting fees.

WORK SPACE AND ANSWER

ANSWER KEY

Function Matchup

GRADE 8 · 8.F.B

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For y = 4x + 6, find y when x = 7.	**34**
2	A linear function has a rate of change of -4 and an initial value of 10. Write its rule.	**y = -4x + 10**
3	For y = -6x + 13, state the rate of change and the initial value.	**Rate of change: -6; initial value: 13**
4	For y = 9x - 4, find y when x = 12.	**104**
5	A linear relationship passes through (0, 16) and (4, 44). Write its rule.	**y = 7x + 16**

PART 2 · APPLY IT

1. **y = 4x + 17; $53** The entry fee is the initial value and the cost per extra game is the rate. Substitute x = 9 into y = 4x + 17.
2. **y = 7x + 12; $40** The unlock cost is the initial value and the hourly cost is the rate. Substitute x = 4 into y = 7x + 12.

CHALLENGE

The plans cost the same at x = 4 months, when each costs $56. Plan B costs less before 4 months because it starts lower. Plan A costs less after 4 months because its monthly rate is lower.

Accept equivalent equation forms, such as 10 - 4x for y = -4x + 10. For the challenge, accept a correct comparison based on testing a value before and after x = 4.