LESSON MAKER PRO

Function Model Lab

Use linear rules to connect inputs and outputs.

GRADE 8 · 8.F.B

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

NAME _____ DATE _____

BUILD A LINEAR MODEL

A linear function models a relationship that changes by the same amount for each 1-unit change in the input. In y = mx + b, m is the rate of change and b is the initial value, or the output when x = 0.

WORKED EXAMPLE

A function has the rule y = 7x + 13. Find y when x = 8.

1. Substitute 8 for x: y = 7(8) + 13.
2. Multiply: y = 56 + 13.
3. Add: y = 69.

Answer: y = 69

PRACTICE 6 problems

1 This table shows a linear function. Write its rule. x: 0, 2, 4 y: 5, 11, 17

ANSWER _____

2 For y = -2x + 9, find y when x = 6.

ANSWER _____

3 A linear function has a rate of change of 5 and an initial value of -4. Write its rule.

ANSWER _____

4 For y = (1/2)x + 14, state the rate of change and the initial value.

ANSWER _____

5 This table shows a linear function. Find the output when x = 9. x: 1, 3, 5 y: 12, 20, 28

ANSWER _____

6 Function A is y = 4x + 1. Function B is y = 2x + 9. Which function has the greater output when x = 5?

ANSWER _____

APPLY IT Show your work

1 An online art club charges a $6 sign-up fee and $3 each month. Let C be the total cost after m months. Write a function for C, then find the total cost after 10 months.

WORK SPACE

ANSWER _____

2 Riley has $20 saved and earns $15 for each hour of dog walking. Let S be Riley's total savings after h hours. Write a function for S, then find the total after 4 hours.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A game gives 11 coins at level 2 and 23 coins at level 6. The number of coins changes at a constant rate. Write a function y for the number of coins at level x, then find the number of coins at level 10.

_____

_____

ANSWER KEY

Function Model Lab

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	This table shows a linear function. Write its rule. x: 0, 2, 4 y: 5, 11, 17	**y = 3x + 5**
2	For y = -2x + 9, find y when x = 6.	**y = -3**
3	A linear function has a rate of change of 5 and an initial value of -4. Write its rule.	**y = 5x - 4**
4	For y = (1/2)x + 14, state the rate of change and the initial value.	**Rate of change: 1/2; initial value: 14**
5	This table shows a linear function. Find the output when x = 9. x: 1, 3, 5 y: 12, 20, 28	**44**
6	Function A is y = 4x + 1. Function B is y = 2x + 9. Which function has the greater output when x = 5?	**Function A**

PART 2 · APPLY IT

1. **C = 3m + 6; $36** The monthly rate is 3, and the sign-up fee is the initial value of 6. Substitute m = 10 to get C = 36.
2. **S = 15h + 20; $80** The hourly earning rate is 15, and the starting savings are 20. Substitute h = 4 to get S = 80.

CHALLENGE

y = 3x + 5; 35 coins

Accept equivalent equation forms with the terms reversed, such as 5 + 3x. For word problems, require both the function rule and the requested total.