LESSON MAKER PRO

Function Builder Lab

Turn rates and starting amounts into rules.

HIGH SCHOOL · HSF-BF.A

CCSS.Math.Content.HSF-BF.A "Build a function that models a relationship between two quantities"

NAME _____ DATE _____

BUILD THE RULE

A function rule connects an input x to one output. In a linear situation, multiply x by the rate of change, then add the starting amount.

WORKED EXAMPLE

An art club charges a $12 signup fee and $3 per workshop. Let x be the number of workshops. Write f(x).

1. Start with the signup fee: f(x)=12.
2. Add $3 for each workshop: add 3x.
3. Write the rule: f(x)=3x+12.

Answer: f(x)=3x+12

PRACTICE 5 problems

1 Use the table. Write a linear function f(x).

INPUT AND OUTPUT

x	f(x)
2	9
4	17
6	25

ANSWER _____

2 In a video game, your score starts at -5 and increases by 6 for each completed level. Write f(x), then find f(7).

ANSWER _____

3 A plant is 9 cm tall and grows 2 cm each week. Write f(x), where x is the number of weeks.

ANSWER _____

4 The area of a square with side length x is reduced by 8 square units. Write f(x).

ANSWER _____

5 A fundraiser has a $14 setup cost and brings in $5 per item sold. Write f(x) for profit, then find f(4).

ANSWER _____

APPLY IT Show your work

1 You sell custom phone stickers for $2 each and pay $11 for materials. Let x be the number of stickers sold. Write a profit function f(x). State a reasonable domain for x.

WORK SPACE

ANSWER _____

2 A school esports team receives $9 for each round won but pays a $5 entry fee. Let x be the number of rounds won. Write f(x) for net earnings, then find f(4).

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student earns $8 per video edited for the first 5 videos. Each video after the first 5 earns $11. Let x be the number of videos edited. Write a piecewise function f(x). Explain why the second rule starts with 40.

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the table. Write a linear function f(x).	**f(x)=4x+1**
2	In a video game, your score starts at -5 and increases by 6 for each completed level. Write f(x), then find f(7).	**f(x)=6x-5; f(7)=37**
3	A plant is 9 cm tall and grows 2 cm each week. Write f(x), where x is the number of weeks.	**f(x)=2x+9**
4	The area of a square with side length x is reduced by 8 square units. Write f(x).	**$f(x)=x^2-8$**
5	A fundraiser has a $14 setup cost and brings in $5 per item sold. Write f(x) for profit, then find f(4).	**f(x)=5x-14; f(4)=6**

PART 2 · APPLY IT

1. **f(x)=2x-11; x is a nonnegative whole number.** Multiply the number sold by 2, then subtract the 11-dollar materials cost. Stickers sold must be a nonnegative whole number.
2. **f(x)=9x-5; f(4)=31** Multiply rounds won by 9 and subtract the entry fee. Substitute 4 to get 36-5=31.

CHALLENGE

f(x)=8x for 0≤x≤5; f(x)=40+11(x-5) for x>5, where x is a whole number. The 40 represents the earnings from the first 5 videos, because 5(8)=40.

Accept equivalent algebraic forms, including 11x-15 for the second challenge rule. Accept any clear statement that x represents nonnegative whole items, rounds, or videos when a domain is requested.