LESSON MAKER PRO

Context Connection

Turn linear rules into real situations.

GRADE 8 · 8.PFA.3.f

8.PFA.3.f "Create a context for a linear function given a graph, table, or equation in the form y = mx + b."

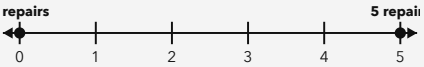
NAME _____ DATE _____

BUILD A SITUATION

In y = mx + b, m is the amount that changes for each 1 unit of x, and b is the starting amount when x is 0. Choose what x and y measure, then describe a situation with the correct starting amount and rate of change.

WORKED EXAMPLE

The number line shows possible whole-number values of x, the number of phone repairs. A repair app uses y = 9x + 13. Create a context for the equation. Tell what y means.



1. In y = 9x + 13, the rate is 9 and the starting amount is 13.
2. Let x be the number of phone repairs and y be the total cost in dollars.
3. The app charges a $13 service fee and $9 for each repair.

Answer: The total cost y, in dollars, for x phone repairs is $13 plus $9 for each repair.

PRACTICE 6 problems

1 Create a context for y = 3x + 5. Tell what x and y mean.

ANSWER _____

2 Create a context for y = -2x + 16. Tell what x and y mean.

ANSWER _____

3 Create a context for y = 1/2x + 12. Tell what x and y mean.

ANSWER _____

4 Create a context for y = -4x + 30. Tell what x and y mean.

ANSWER _____

5 Create a context for y = 7x - 6. Tell what x and y mean.

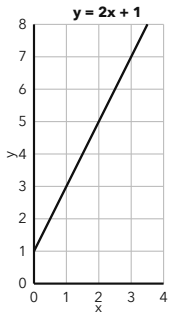
ANSWER _____

6 Create a context for y = -1/3x + 20. Tell what x and y mean.

ANSWER _____

APPLY IT Show your work

1 The graph shows a linear relationship. Create a context about a school snack cart that matches the graph. Then find y when x = 3.



ANSWER _____

2 The table shows an online game player's coin total after several days. Write a context that matches the table, including what x and y mean. Then predict the coin total when x = 8.

COIN TOTAL

x, days	y, coins
0	10
2	16
4	22
6	28

ANSWER _____

CHALLENGE One step up

Create a context for y = -6x + 50 in which x must be a whole number. State the greatest possible value of x if y cannot be negative, and explain why.

WORK SPACE AND ANSWER

ANSWER KEY

Context Connection

GRADE 8 · 8.PFA.3.f

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Create a context for y = 3x + 5. Tell what x and y mean.	**A music playlist starts with 5 songs and adds 3 songs each hour. x is the number of hours, and y is the total number of songs.**
2	Create a context for y = -2x + 16. Tell what x and y mean.	**A player begins with 16 game tokens and spends 2 tokens each round. x is the number of rounds, and y is the number of tokens left.**
3	Create a context for y = 1/2x + 12. Tell what x and y mean.	**A student has $12 and earns $0.50 for each completed chore. x is the number of chores, and y is the total amount of money in dollars.**
4	Create a context for y = -4x + 30. Tell what x and y mean.	**A water cooler starts with 30 ounces of water and loses 4 ounces each hour. x is the number of hours, and y is the number of ounces of water left.**
5	Create a context for y = 7x - 6. Tell what x and y mean.	**A student owes $6 and earns $7 for each dog-walking job. x is the number of jobs, and y is the student's balance in dollars.**
6	Create a context for y = -1/3x + 20. Tell what x and y mean.	**A phone has 20 gigabytes of free storage, and each downloaded video uses 1/3 gigabyte. x is the number of videos, and y is the number of gigabytes of free storage left.**

PART 2 · APPLY IT

1. **A school snack cart starts with 1 tray of fruit cups and adds 2 trays each lunch period. x is the number of lunch periods, and y is the total number of trays. When x = 3, y = 7 trays.** The graph has a starting value of 1 and increases by 2 for each 1 unit of x. At x = 3, the graph shows y = 7.
2. **A player starts with 10 coins and earns 3 coins each day. x is the number of days, and y is the total number of coins. When x = 8, y = 34 coins.** The coin total rises 6 coins every 2 days, so it rises 3 coins per day from a starting total of 10. Use y = 3x + 10 to get 34 when x = 8.

CHALLENGE

A club starts with 50 tickets and gives away 6 tickets each day. x is the number of days, and y is the number of tickets left. The greatest possible whole-number value of x is 8 because y = 2 when x = 8, but y would be -4 when x = 9.

Accept any realistic context that correctly identifies x and y, gives the stated starting value, and uses the stated rate of change. Equivalent wording and units are acceptable.