LESSON MAKER PRO

Linear Decisions

Find a value, then explain what it means.

GRADE 8 · PA.A.2.5

PA.A.2.5 "Solve problems involving linear functions and interpret results in the original context."

NAME _____ DATE _____

THE BIG IDEA

A linear rule changes by the same amount each time the input increases by 1. Use two known values to find that rate, then use y = mx + b to find the value you need. In a story, include units in your answer.

WORKED EXAMPLE

The table follows a linear rule. Find y when x = 11.

KNOWN VALUES

x	y
3	23
9	59

1. Rate: (59 - 23)/(9 - 3) = 6.
2. Use y = 6x + b: 23 = 6(3) + b, so b = 5.
3. When x = 11, y = 6(11) + 5 = 71.

Answer: y = 71

PRACTICE 4 problems

1 For y = 4x + 8, find y when x = 12.

ANSWER _____

2 A linear rule gives y = 18 when x = 1 and y = 42 when x = 4. Find its rate of change.

ANSWER _____

3 A line has a rate of 2 and passes through (4, 18). Find y when x = 12.

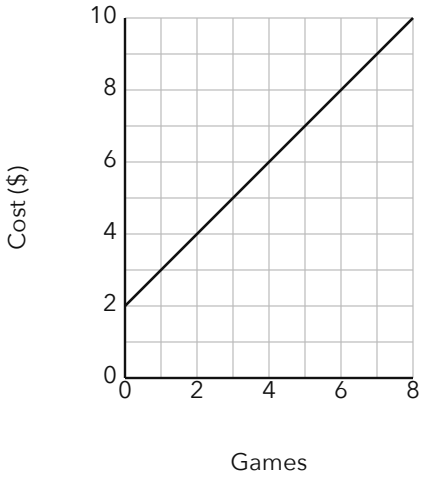
ANSWER _____

4 For y = 4x + 12, find x when y = 44.

ANSWER _____

APPLY IT Show your work

1 The graph shows the total cost of an arcade card and games. What is the cost of 8 games? What does the cost at 0 games mean?



ANSWER _____

2 A music app charges $4 to join and $3 per month. Your total is $28. How many months have you paid for?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Store A charges $8 plus $2 per day for a game rental. Store B charges $4 plus $3 per day. After how many days will the costs match, and what will each cost? Show an equation.

WORK SPACE AND ANSWER

ANSWER KEY

Linear Decisions

GRADE 8 · PA.A.2.5

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For y = 4x + 8, find y when x = 12.	**y = 56**
2	A linear rule gives y = 18 when x = 1 and y = 42 when x = 4. Find its rate of change.	**8**
3	A line has a rate of 2 and passes through (4, 18). Find y when x = 12.	**y = 34**
4	For y = 4x + 12, find x when y = 44.	**x = 8**

PART 2 · APPLY IT

1. **8 games cost $10. The $2 cost at 0 games is the price of the arcade card.** Read $10 at 8 games and $2 at 0 games from the graph.
2. **8 months** Solve 4 + 3x = 28 to get x = 8 months.

CHALLENGE

8 + 2x = 4 + 3x, so x = 4. After 4 days, each rental costs $16.

Accept equivalent equations and clear explanations of the arcade card's $2 starting cost.