LESSON MAKER PRO

Graph the Story

Write rules and predict from linear relationships.

GRADE 8 · 8A.AF.E.14

8A.AF.E.14 "Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions. Limit to contexts arising from linear..."

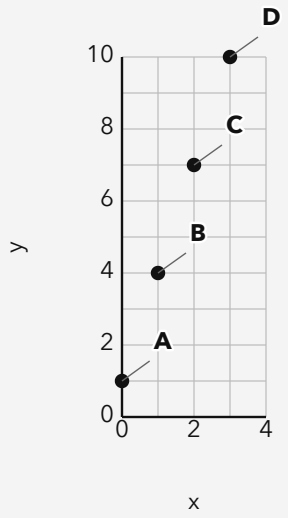
NAME _____ DATE _____

FROM GRAPH TO RULE

For a straight-line graph, use y = mx + b. The value b is where the line meets the y-axis, and m is the change in y when x rises by 1. Label each axis and use equal intervals to make predictions.

WORKED EXAMPLE

Use the graphed points to write an equation. Predict y when x = 4.



1. At x = 0, y = 1, so b = 1.
2. Each time x rises by 1, y rises by 3, so m = 3.
3. Write y = 3x + 1.
4. At x = 4, y = 3(4) + 1 = 13.

Answer: y = 3x + 1; y = 13 when x = 4.

PRACTICE 4 problems

1 A game pass costs $4 plus $2 per visit. Let x be visits and y be total dollars. Write an equation.

ANSWER _____

2 A bike ride starts 5 miles from home and goes 4 miles farther each hour. Let x be hours and y be miles from home. Write an equation and find y when x = 2.

ANSWER _____

3 A playlist has 6 songs and gains 5 songs each day. Let x be days and y be songs. Write an equation.

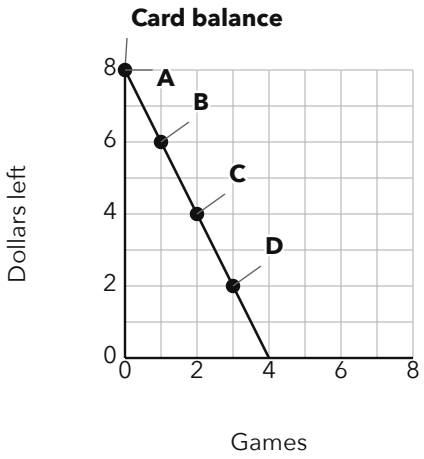
ANSWER _____

4 A candle is 8 cm tall and burns 2 cm each hour. Let x be hours and y be its height in cm. Write an equation and find y when x = 3.

ANSWER _____

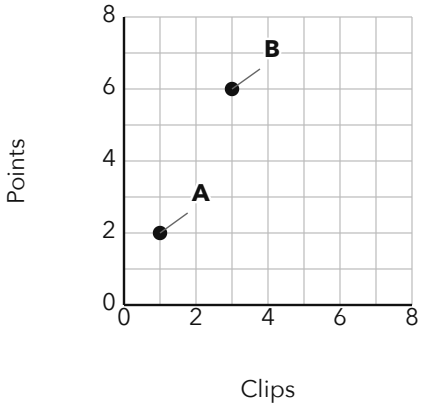
APPLY IT Show your work

1 Your arcade card loses money each time you play. Use the graph to write y, the dollars left after x games. Predict the balance after 4 games.



ANSWER _____

2 Your video channel earns points for posting clips. Use A and B to write y, the points after x clips. Draw the line and predict the points after 4 clips.



ANSWER _____

CHALLENGE One step up

A photo booth costs $4 to start. The first 3 prints cost $2 each, and later prints cost $1 each. Let x be prints and y be total dollars. Write a rule for each price range and find the cost of 5 prints.

WORK SPACE AND ANSWER

ANSWER KEY

Graph the Story

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A game pass costs $4 plus $2 per visit. Let x be visits and y be total dollars. Write an equation.	**y = 2x + 4**
2	A bike ride starts 5 miles from home and goes 4 miles farther each hour. Let x be hours and y be miles from home. Write an equation and find y when x = 2.	**y = 4x + 5; y = 13 miles.**
3	A playlist has 6 songs and gains 5 songs each day. Let x be days and y be songs. Write an equation.	**y = 5x + 6**
4	A candle is 8 cm tall and burns 2 cm each hour. Let x be hours and y be its height in cm. Write an equation and find y when x = 3.	**y = 8 - 2x; y = 2 cm.**

PART 2 · APPLY IT

1. **y = 8 - 2x; $0 after 4 games.** The graph starts at $8 and drops $2 per game. Substitute x = 4 to get y = 0.
2. **y = 2x; 8 points after 4 clips. The line passes through (0, 0), A, B, and (4, 8).** From A to B, points rise by 4 as clips rise by 2, so the rate is 2 points per clip. Use A to find a starting value of 0, then substitute x = 4.

CHALLENGE

For 0 ≤ x ≤ 3, y = 4 + 2x. For x > 3, y = 10 + (x - 3), or y = x + 7. Five prints cost $12.

Accept equivalent equations. For the video channel graph, accept a straight line through both given points that reaches (4, 8).