LESSON MAKER PRO

Rates on Graphs

Connect points, equations, and real-world rates.

GRADE 7 · 7.AT.A.3

7.AT.A.3 "Represent proportional relationships between quantities. Represent proportional relationships using equations. Explain what a point (x, y) on the graph of a proportional relationship represents in terms of the context..."

NAME _____ DATE _____

THE BIG IDEA

A proportional relationship has the equation y = rx, where r is the unit rate. On its graph, find r by dividing a nonzero y-value by its x-value.

WORKED EXAMPLE

A tank fills at a steady rate. On the graph, x is minutes and y is liters added. Write the equation. What does (1, r) mean?



1. At P, y/x = 3/4.
2. Write the equation: y = (3/4)x.
3. At (1, 3/4), the tank has gained 3/4 liter in 1 minute.

Answer: y = (3/4)x; (1, 3/4) means 3/4 liter is added in 1 minute.

PRACTICE 4 problems

1 A club earns $10 for every 2 posters it sells. Let x be posters and y be dollars earned. Write an equation.

ANSWER _____

2 A proportional relationship contains (5, 20). Find its unit rate r and write y = rx.

ANSWER _____

3 A player earns 8 coins per level. Let x be levels and y be coins. What does (0, 0) mean?

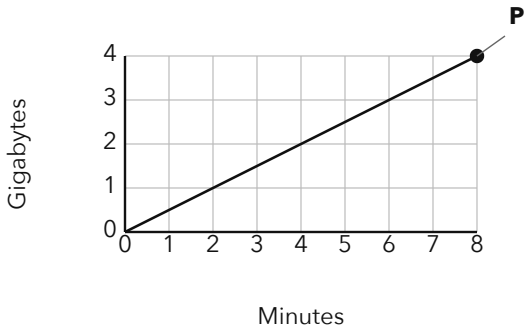
ANSWER _____

4 The equation y = 6x gives stars earned, y, after x missions. What does (2, 12) mean?

ANSWER _____

APPLY IT Show your work

1 A gamer downloads a game at a steady rate. The graph shows gigabytes downloaded, y, after x minutes. Write the equation and explain what (1, r) means.



ANSWER _____

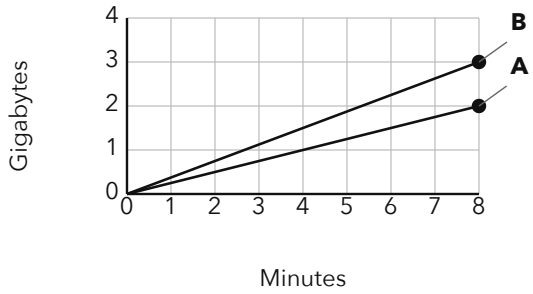
2 Phone charms cost $9 each. Let x be charms and y be total cost in dollars. Write an equation. Explain what (0, 0) and (1, r) mean.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two players upload videos at steady rates. Each line shows gigabytes uploaded, y, after x minutes. Write an equation for A and B. Who uploads faster, and by how many gigabytes per minute?



WORK SPACE AND ANSWER

ANSWER KEY

Rates on Graphs

GRADE 7 · 7.AT.A.3

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A club earns $10 for every 2 posters it sells. Let x be posters and y be dollars earned. Write an equation.	**y = 5x**
2	A proportional relationship contains (5, 20). Find its unit rate r and write y = rx.	**r = 4; y = 4x**
3	A player earns 8 coins per level. Let x be levels and y be coins. What does (0, 0) mean?	**At 0 levels, the player has earned 0 coins.**
4	The equation y = 6x gives stars earned, y, after x missions. What does (2, 12) mean?	**After 2 missions, the player has earned 12 stars.**

PART 2 · APPLY IT

1. **y = (1/2)x; (1, 1/2) means 1/2 gigabyte downloads in 1 minute.** The graphed point gives r = 4/8 = 1/2 gigabyte per minute.
2. **y = 9x; (0, 0) means 0 charms cost $0, and (1, 9) means 1 charm costs $9.** The cost per charm is $9, so multiply the number of charms by 9.

CHALLENGE

A: y = (1/4)x. B: y = (3/8)x. B uploads faster by 1/8 gigabyte per minute.

Accept equivalent fraction or decimal forms of the rates. Point explanations must name both quantities and their units.