LESSON MAKER PRO

Spot the Rate

Use ratios, tables, and graphs to test relationships.

GRADE 7 · 7.RP.A.2

7.RP.A.2 "Represent a relationship between two quantities and determine whether the two quantities are related proportionally. a. Use equivalent ratios displayed in a table or in a graph of the relationship in the coordinate plane to determine..."

NAME _____ DATE _____

THE BIG IDEA

For a proportional relationship, y/x is the same for every nonzero x. This unit rate r gives the equation y = rx, and the graph is a line through (0,0).

WORKED EXAMPLE

Is the relationship in the table proportional? If so, write its equation.

x	y
7	42
14	84
21	126

1. 42/7 = 6
2. 84/14 = 6 and 126/21 = 6
3. The ratios match, so the relationship is proportional.

Answer: y = 6x

PRACTICE 4 problems

1 For (x, y) = (2, 8), (4, 16), and (8, 32), is the relationship proportional? Give the unit rate.

ANSWER _____

2 For (x, y) = (2, 9), (4, 18), and (8, 35), is the relationship proportional? Show why.

ANSWER _____

3 For y = 3x, give the unit rate and find y when x = 9.

ANSWER _____

4 Each song download costs $2.50. Write an equation for the total cost y of x songs.

ANSWER _____

APPLY IT Show your work

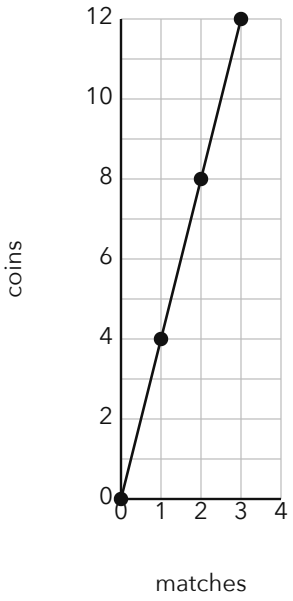
1 An arcade awards tickets for each round played. Is the relationship in the table proportional? Give the unit rate and an equation for y tickets after x rounds.

ARCADE TICKETS

Rounds (x)	Tickets (y)
1	9
2	18
4	36

ANSWER _____

2 The graph shows coins won in a game. Is the relationship proportional? Give the coins per match, then explain (0,0) and (1,4).



ANSWER _____

CHALLENGE One step up

A quiz club gives 8 points per quiz plus 10 bonus points for joining. Is total points proportional to quizzes completed? Explain using zero quizzes.

WORK SPACE AND ANSWER

ANSWER KEY

Spot the Rate

GRADE 7 · 7.RP.A.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For (x, y) = (2, 8), (4, 16), and (8, 32), is the relationship proportional? Give the unit rate.	**Yes. The unit rate is 4.**
2	For (x, y) = (2, 9), (4, 18), and (8, 35), is the relationship proportional? Show why.	**No. 9/2 = 18/4, but 35/8 is different.**
3	For y = 3x, give the unit rate and find y when x = 9.	**Unit rate: 3. When x = 9, y = 27.**
4	Each song download costs $2.50. Write an equation for the total cost y of x songs.	**y = 2.50x**

PART 2 · APPLY IT

1. **Yes. The unit rate is 9 tickets per round, and y = 9x.** Each tickets-to-rounds ratio is 9, so the relationship is proportional.
2. **Yes. The rate is 4 coins per match. (0,0) means 0 matches earn 0 coins. (1,4) means 1 match earns 4 coins.** The plotted points lie on a line through the origin, and each nonzero point has a coins-to-matches ratio of 4.

CHALLENGE

No. With zero quizzes, a member has 10 points, not 0, so the relationship is not proportional.

Accept equivalent equations and explanations. For the graph, students should connect (1,4) to the unit rate and (0,0) to earning no coins from no matches.