LESSON MAKER PRO

Rate Rule Rally

Turn constant rates into equations.

GRADE 7 · NY-7.RP.2.c

NY-7.RP.2.c "Represent a proportional relationship using an equation."

NAME _____ DATE _____

BUILD THE EQUATION

A proportional relationship can be written as y = kx. The number k is the constant rate, so find it by dividing y by x, then use it to write the equation.

WORKED EXAMPLE

A music download plan costs $84 for 12 months. Let x be the number of months and y be the total cost in dollars. Write an equation for the relationship.

1. Find the constant rate: 84 / 12 = 7.
2. Use the proportional form y = kx.
3. Replace k with 7: y = 7x.

Answer: y = 7x

PRACTICE 6 problems

1 A proportional relationship has y = 48 when x = 6. Write the equation.

ANSWER _____

2 A proportional relationship has y = 36 when x = 4. Write the equation.

ANSWER _____

3 A proportional relationship has y = 21 when x = 14. Write the equation.

ANSWER _____

4 A cyclist travels 55 miles in 5 hours at a constant speed. Let x be hours and y be miles. Write the equation.

ANSWER _____

5 A proportional relationship includes the points (2, 10) and (3, 15). Write the equation.

ANSWER _____

6 A proportional relationship has y = 18 when x = 24. Write the equation.

ANSWER _____

APPLY IT Show your work

1 The student council sells custom water-bottle decals for $3 each. Let x be the number of decals and y be the total cost in dollars. Write an equation, then find the cost of 25 decals.

WORK SPACE

ANSWER _____

2 A student saves music files for a playlist. The table shows the storage used, y, for x songs. Write an equation, then find the storage used for 8 songs.

PLAYLIST STORAGE

Songs, x	Storage used in MB, y
1	45
3	135
5	225

ANSWER _____

CHALLENGE One step up

A game gives 5 coins for each quest you finish, plus 13 bonus coins when you join. Let x be the number of quests and y be the total number of coins. Maya says the relationship is proportional because 1 quest gives 18 coins. Is Maya correct? Explain, and write the equation.

WORK SPACE AND ANSWER

ANSWER KEY

Rate Rule Rally

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A proportional relationship has y = 48 when x = 6. Write the equation.	**y = 8x**
2	A proportional relationship has y = 36 when x = 4. Write the equation.	**y = 9x**
3	A proportional relationship has y = 21 when x = 14. Write the equation.	**y = 3/2x**
4	A cyclist travels 55 miles in 5 hours at a constant speed. Let x be hours and y be miles. Write the equation.	**y = 11x**
5	A proportional relationship includes the points (2, 10) and (3, 15). Write the equation.	**y = 5x**
6	A proportional relationship has y = 18 when x = 24. Write the equation.	**y = 3/4x**

PART 2 · APPLY IT

1. **y = 3x; 25 decals cost $75.** The constant rate is 3 dollars per decal, so y = 3x. Substitute x = 25 to get y = 75.
2. **y = 45x; 8 songs use 360 MB.** Divide storage by songs to find the constant rate, 45 MB per song. Use y = 45x, then substitute x = 8.

CHALLENGE

No. The equation is y = 5x + 13. When x = 0, y = 13, not 0, so the relationship is not proportional.

Accept equivalent equation forms, such as 8x = y. For the challenge, students should state that the starting value is 13 rather than 0 and give y = 5x + 13.