LESSON MAKER PRO

Proportion Power

Analyze rates and represent proportional relationships.

GRADE 7 · MA.7.AR.4

MA.7.AR.4 "Analyze and represent two-variable proportional relationships."

NAME _____ DATE _____

CONSTANT RATE RULE

In a proportional relationship, y is always the same multiple of x. Find the constant of proportionality by dividing y by x, then write the rule as y = kx. You can use the rule to find any missing value.

WORKED EXAMPLE

When x = 4, y = 28 in a proportional relationship. Write an equation, then find y when x = 9.

1. Find k: 28 / 4 = 7.
2. Write the equation: y = 7x.
3. Substitute 9 for x: y = 7(9) = 63.

Answer: y = 7x; when x = 9, y = 63

PRACTICE 6 problems

1 Use the table. Write an equation for the relationship. Then find y when x = 10.

PROPORTIONAL RELATIONSHIP

x	y
3	15
8	40

ANSWER _____

2 The relationship is y = 6x. Find y when x = 11.

ANSWER _____

3 In a proportional relationship, y = 48 when x = 12. Find x when y = 72.

ANSWER _____

4 The relationship is y = 3x. Find x when y = 51.

ANSWER _____

5 The ordered pairs are (1, 10), (5, 50), and (8, 80). Is the relationship proportional? Write its equation.

ANSWER _____

6 Relationship A is y = 8x. Relationship B is y = 11x. Which relationship has the greater constant of proportionality, and by how much?

ANSWER _____

APPLY IT Show your work

1 A game gives 13 coins for each quest you complete. Let x be the number of quests and y be the number of coins. Write an equation for the relationship. How many coins do you earn for 8 quests?

WORK SPACE

ANSWER _____

2 A music app uses 12 MB of storage for each song you download. Let x be the number of songs and y be the storage used in MB. Write an equation for the relationship. How much storage is used for 15 songs?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A proportional relationship includes the point (14, 112). Write an equation for the relationship. Does the point (20, 160) belong to the relationship? Explain using the equation.

WORK SPACE AND ANSWER

ANSWER KEY

Proportion Power

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the table. Write an equation for the relationship. Then find y when x = 10.	**y = 5x; y = 50**
2	The relationship is y = 6x. Find y when x = 11.	**66**
3	In a proportional relationship, y = 48 when x = 12. Find x when y = 72.	**18**
4	The relationship is y = 3x. Find x when y = 51.	**17**
5	The ordered pairs are (1, 10), (5, 50), and (8, 80). Is the relationship proportional? Write its equation.	**Yes; y = 10x**
6	Relationship A is y = 8x. Relationship B is y = 11x. Which relationship has the greater constant of proportionality, and by how much?	**Relationship B; 3**

PART 2 · APPLY IT

1. **y = 13x; 104 coins** The unit rate is 13 coins per quest, so y = 13x. Substitute 8 for x to get y = 13(8) = 104.
2. **y = 12x; 180 MB** The unit rate is 12 MB per song, so y = 12x. Substitute 15 for x to get y = 12(15) = 180.

CHALLENGE

y = 8x; Yes, because 8(20) = 160.

Accept equivalent equation forms, such as y/5 = x for y = 5x. For the challenge, accept any clear explanation that verifies the second point using y = 8x.