

Translate the Rate

Move between words, tables, and equations.

GRADE 7 • MA.7.AR.4.4

MA.7.AR.4.4 "Given any representation of a proportional relationship, translate the representation to a written description, table or equation."

NAME _____

DATE _____

ONE CONSTANT RATE

When y is proportional to x , y equals a constant times x . Divide any y -value by its matching x -value to find the constant rate. Use that rate to write an equation, build a table, or describe the relationship in words.

WORKED EXAMPLE

A table has $x = 13$ and $y = 65$. Write an equation that relates y to x .

1. Find the unit rate: $65 / 13 = 5$.
2. A proportional equation has the form $y = \text{rate } x$.
3. Substitute the rate: $y = 5x$.

Answer: $y = 5x$

PRACTICE 6 problems

- 1** The table represents a proportional relationship. Write an equation. x : 2, 4, 7 y : 6, 12, 21

ANSWER _____

- 2** Write a description in words for the equation $y = 9x$.

ANSWER _____

- 3** A snack stand sells identical smoothies for \$6 each. Let x be the number of smoothies and y be the total cost. Make a table for $x = 1, 3$, and 4.

ANSWER _____

- 4** The ordered pairs (1, 12), (2, 24), and (4, 48) represent a proportional relationship. Write an equation.

ANSWER _____

- 5** The table represents a proportional relationship. Write a description in words. x : 2, 4, 6 y : 20, 40, 60

ANSWER _____

- 6** The equation $y = 1/4x$ represents a proportional relationship. Make a table for $x = 4, 12$, and 20.

ANSWER _____

APPLY IT Show your work

- 1** A game gives 12 gems for each quest you complete. Let x be the number of quests and y be the number of gems. Write an equation and make a table for $x = 2, 4$, and 7 .

WORK SPACE

ANSWER _____

- 2** Jordan earns \$21 for 3 hours of walking a neighbor's dogs at a constant rate. Let x be the number of hours and y be the dollars earned. Write an equation and make a table for $x = 2, 4$, and 6 .

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A student says a points system is represented by $y = 6x$. The written description says, "You earn 6 points for each task." A table shows x : 2, 4, 7 and y : 12, 24, 40. Which table entry is incorrect? Explain how you know.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	The table represents a proportional relationship. Write an equation. x: 2, 4, 7 y: 6, 12, 21	$y = 3x$
2	Write a description in words for the equation $y = 9x$.	y is 9 times x.
3	A snack stand sells identical smoothies for \$6 each. Let x be the number of smoothies and y be the total cost. Make a table for x = 1, 3, and 4.	x: 1, 3, 4; y: 6, 18, 24
4	The ordered pairs (1, 12), (2, 24), and (4, 48) represent a proportional relationship. Write an equation.	$y = 12x$
5	The table represents a proportional relationship. Write a description in words. x: 2, 4, 6 y: 20, 40, 60	y is 10 times x.
6	The equation $y = \frac{1}{4}x$ represents a proportional relationship. Make a table for x = 4, 12, and 20.	x: 4, 12, 20; y: 1, 3, 5

PART 2 • APPLY IT

- $y = 12x$; x: 2, 4, 7; y: 24, 48, 84** The constant rate is 12 gems per quest, so multiply each x-value by 12. The equation is $y = 12x$.
- $y = 7x$; x: 2, 4, 6; y: 14, 28, 42** Divide 21 by 3 to find the unit rate of \$7 per hour. Use $y = 7x$ and multiply each hour value by 7.

CHALLENGE

The entry (7, 40) is incorrect. It should be (7, 42) because $6 \times 7 = 42$.

Accept equivalent wording for written descriptions that clearly states the constant rate. Accept tables in any clear format with the correct matching x-values and y-values.