

Proportion Power Path

Practice tables, graphs, equations, and real situations.

GRADE 7 • 7.PAR.4

7.PAR.4 "Recognize proportional relationships in relevant, mathematical problems; represent, solve, and explain these relationships with tables, graphs, and equations."

NAME _____

DATE _____

THE BIG IDEA

A relationship is proportional when y/x stays the same for every pair with a nonzero x -value. You can write a proportional relationship as $y = kx$, where k is the constant of proportionality, and its graph passes through $(0, 0)$.

WORKED EXAMPLE

A proportional relationship follows $y = 13x$. Find y when $x = 2$.

1. Start with $y = 13x$.
2. Substitute 2 for x : $y = 13(2)$.
3. Multiply: $y = 26$.

Answer: $y = 26$

PRACTICE 6 problems

- 1** Table: $x = 3, 6, 9$ and $y = 15, 30, 45$. Is y proportional to x ? Write an equation.

ANSWER _____

- 2** A graph passes through the origin and includes the points $(4, 36)$, $(7, 63)$, and $(10, 90)$. Write its equation.

ANSWER _____

- 3** Table: $x = 3, 5, 8$ and $y = 15, 25, 39$. Is this relationship proportional? Explain.

ANSWER _____

- 4** A line on a coordinate grid passes through the origin and the point $(6, 42)$. Write the equation of the line.

ANSWER _____

- 5** For the proportional relationship $y = 14x$, find x when $y = 84$.

ANSWER _____

- 6** Table: $x = 3, 7, 9$ and $y = 15, 35, 45$. For the same proportional relationship, find y when $x = 11$.

ANSWER _____

APPLY IT Show your work

- 1** A school gaming club rents controllers for \$6 per session. Let x be the number of sessions and y be the total cost in dollars. Write an equation, then find the cost for 8 sessions.

WORK SPACE

ANSWER _____

- 2** A music festival app gives 8 reward points for each song review. Let x be the number of reviews and y be the total points. Is the relationship proportional? Write an equation and find how many reviews earn 56 points.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Compare these bike-share plans. Plan A costs \$4 per ride. Plan B costs a \$5 unlock fee plus \$3 per ride. Let x be the number of rides. For what value of x do the plans cost the same? Which plan is a proportional relationship? Explain.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Table: $x = 3, 6, 9$ and $y = 15, 30, 45$. Is y proportional to x ? Write an equation.	Yes. $y = 5x$.
2	A graph passes through the origin and includes the points $(4, 36)$, $(7, 63)$, and $(10, 90)$. Write its equation.	$y = 9x$
3	Table: $x = 3, 5, 8$ and $y = 15, 25, 39$. Is this relationship proportional? Explain.	No. The first two pairs have $y/x = 5$, but $39/8$ is not 5.
4	A line on a coordinate grid passes through the origin and the point $(6, 42)$. Write the equation of the line.	$y = 7x$
5	For the proportional relationship $y = 14x$, find x when $y = 84$.	$x = 6$
6	Table: $x = 3, 7, 9$ and $y = 15, 35, 45$. For the same proportional relationship, find y when $x = 11$.	$y = 55$

PART 2 • APPLY IT

- $y = 6x$; 8 sessions cost \$48.** The unit rate is \$6 for each session, so $y = 6x$. Substitute $x = 8$ to get $y = 48$.
- Yes; $y = 8x$; 56 points require 7 reviews.** The app gives the same number of points for every review, so the relationship is proportional. Solve $56 = 8x$ to get $x = 7$.

CHALLENGE

The plans cost the same at $x = 5$ rides. Plan A is proportional because its cost is $y = 4x$ and passes through the origin. Plan B is not proportional because its cost is $y = 3x + 5$, which includes a starting fee.

Accept equivalent equation forms, such as $5x = y$. For proportionality explanations, accept statements that identify a constant y/x ratio or a graph that passes through the origin.