

Rate Detectives

Spot the unit rate in every representation.

GRADE 7 • 7.RP.A.2b

CCSS.Math.Content.7.RP.A.2b "Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships."

NAME _____

DATE _____

FIND K

In a proportional relationship written as $y = kx$, find k by dividing y by x . The constant of proportionality tells the amount of y for 1 unit of x .

WORKED EXAMPLE

A repair shop charges y dollars for x hours of work. The relationship is proportional, and 4 hours cost 28 dollars. Find k .

1. Use $k = y/x$.
2. Substitute the values: $k = 28/4$.
3. Divide: $k = 7$.

Answer: $k = 7$ dollars per hour

PRACTICE 6 problems

- 1** A table shows a proportional relationship. x : 2, 5, 8 y : 6, 15, 24 Identify k .

ANSWER _____

- 2** The equation $y = 11x$ represents a proportional relationship. Identify k .

ANSWER _____

- 3** A graph of a proportional relationship passes through the points (1, 6), (3, 18), and (5, 30). Identify k .

ANSWER _____

- 4** A tape diagram shows 3 equal boxes. Each box is labeled 9, and the total is 27. The number of boxes is x and the total is y . Identify k .

ANSWER _____

- 5** A runner travels 15 kilometers in 3 equal hours at a constant speed. Let y be kilometers traveled and x be hours. Identify k .

ANSWER _____

- 6** A table shows a proportional relationship. x : $1/2$, $3/2$, $5/2$ y : 5, 15, 25 Identify k .

ANSWER _____

APPLY IT Show your work

- 1** A streaming club charges 18 dollars for 6 months. The total cost is proportional to the number of months. What is the constant of proportionality, in dollars per month?

WORK SPACE

ANSWER _____

- 2** At an esports club event, a player earns 30 points in 5 rounds. The points earned are proportional to the number of rounds. What is the constant of proportionality, in points per round?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A table has x-values of $\frac{2}{3}$, $\frac{5}{3}$, and $\frac{11}{3}$. The matching y-values are 10, 25, and 55. A student says k is 10 because the first y-value is 10. Is the student correct? Identify k and explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A table shows a proportional relationship. x: 2, 5, 8 y: 6, 15, 24 Identify k.	k = 3
2	The equation $y = 11x$ represents a proportional relationship. Identify k.	k = 11
3	A graph of a proportional relationship passes through the points (1, 6), (3, 18), and (5, 30). Identify k.	k = 6
4	A tape diagram shows 3 equal boxes. Each box is labeled 9, and the total is 27. The number of boxes is x and the total is y. Identify k.	k = 9
5	A runner travels 15 kilometers in 3 equal hours at a constant speed. Let y be kilometers traveled and x be hours. Identify k.	k = 5 kilometers per hour
6	A table shows a proportional relationship. x: $\frac{1}{2}$, $\frac{3}{2}$, $\frac{5}{2}$ y: 5, 15, 25 Identify k.	k = 10

PART 2 • APPLY IT

1. **k = 3 dollars per month** Divide the total cost by the number of months: $18/6 = 3$.
2. **k = 6 points per round** Divide the total points by the number of rounds: $30/5 = 6$.

CHALLENGE

No. k = 15 because $10/(2/3) = 15$, $25/(5/3) = 15$, and $55/(11/3) = 15$.

Accept equivalent unit-rate forms, such as 3 dollars for 1 month. For the challenge, students should state that k is found by dividing y by x, not by choosing a y-value.