

Rate Detective

Find the amount for one unit.

GRADE 7 • 7.PAR.4.2

7.PAR.4.2 "Determine the unit rate (constant of proportionality) in tables, graphs (1, r), equations, diagrams, and verbal descriptions of proportional relationships to solve realistic problems."

NAME _____

DATE _____

FIND THE UNIT RATE

In a proportional relationship, $y = rx$, and r is the unit rate. Divide the output by the input, y/x , to find r . On a graph, the point $(1, r)$ shows the unit rate directly.

WORKED EXAMPLE

A table shows that 2 bags have a mass of 26 kg. Find the constant of proportionality in kilograms per bag.

1. Write $r = y/x = 26/2$.
2. Divide: $26/2 = 13$.
3. Check: $13 \times 2 = 26$.

Answer: $r = 13$ kg per bag

PRACTICE 6 problems

- 1** Table: Packs of stickers: 3, 5 Stickers: 15, 25
Find the constant of proportionality in stickers per pack.

ANSWER _____

- 2** A proportional graph passes through the points $(1, 7)$ and $(6, 42)$. What is the unit rate?

ANSWER _____

- 3** The equation $y = 9x$ represents a proportional relationship. What is the constant of proportionality?

ANSWER _____

- 4** Diagram: [token] [token] [token] [token] -> \$12 Find the unit rate in dollars per token.

ANSWER _____

- 5** A plant grows 30 centimeters in 5 weeks at a constant rate. What is the unit rate?

ANSWER _____

- 6** Table: Posters: 16, 20 Cups of paint: 12, 15
Find the constant of proportionality in cups of paint per poster.

ANSWER _____

APPLY IT Show your work

- 1** A gaming team earns 36 points in 4 rounds at a constant rate. How many points does the team earn per round, and how many points will it earn in 7 rounds?

WORK SPACE

ANSWER _____

- 2** Maya earns \$24 for 3 dog-walking sessions. If she works 8 sessions at the same rate, how much will she earn?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Deal A sells 4 notebooks for \$14. Deal B sells 6 notebooks for \$18. Which deal has the lower unit rate? How much would 8 notebooks cost at that deal? Explain with unit rates.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Table: Packs of stickers: 3, 5 Stickers: 15, 25 Find the constant of proportionality in stickers per pack.	5 stickers per pack
2	A proportional graph passes through the points (1, 7) and (6, 42). What is the unit rate?	7
3	The equation $y = 9x$ represents a proportional relationship. What is the constant of proportionality?	9
4	Diagram: [token] [token] [token] [token] -> \$12 Find the unit rate in dollars per token.	\$3 per token
5	A plant grows 30 centimeters in 5 weeks at a constant rate. What is the unit rate?	6 centimeters per week
6	Table: Posters: 16, 20 Cups of paint: 12, 15 Find the constant of proportionality in cups of paint per poster.	3/4 cup per poster

PART 2 • APPLY IT

- 9 points per round; 63 points in 7 rounds** Divide 36 by 4 to find 9 points per round. Multiply 9 by 7 to find 63 points.
- \$64** Divide \$24 by 3 to find \$8 per session. Multiply \$8 by 8 sessions.

CHALLENGE

Deal B. Deal A costs \$3.50 per notebook, and Deal B costs \$3 per notebook. At Deal B, 8 notebooks cost \$24.

Accept equivalent unit-rate wording, such as 5 stickers/pack or 3/4 cup per poster. For the challenge, accept \$3.5 in place of \$3.50.