LESSON MAKER PRO

Find the Rate

Connect unit rates, tables, graphs, and equations.

GRADE 7 · 7A.PR.A.2.b

7A.PR.A.2.b "Identify the constant of proportionality (unit rate) and express the proportional relationship using multiple representations including tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships."

NAME _____ DATE _____

ONE RATE, MANY FORMS

In a proportional relationship, the ratio y/x is the same for every row where x is not 0. That ratio is the unit rate, k, so you can write the relationship as y = kx. Its graph is a straight line through (0, 0).

WORKED EXAMPLE

Use the table to find the number of stickers per pack. Write an equation where x is packs and y is stickers.

STICKER PACKS

Packs (x)	Stickers (y)
3	21
6	42
12	84

1. Divide stickers by packs: 21/3 = 7.
2. Check another row: 42/6 = 7.
3. The unit rate is 7 stickers per pack, so y = 7x.

Answer: 7 stickers per pack; y = 7x

PRACTICE 6 problems

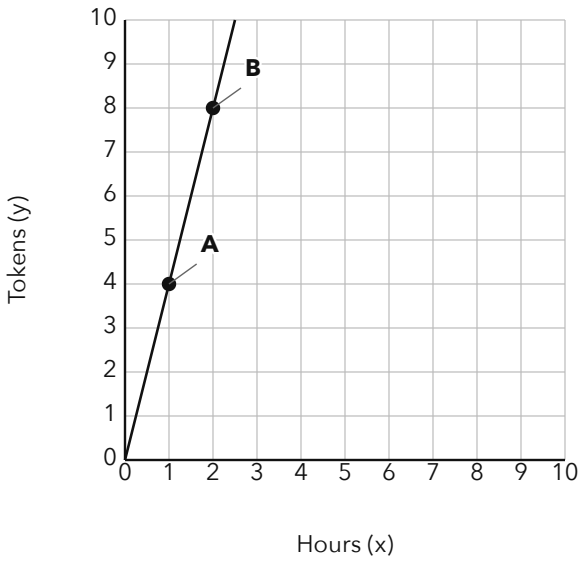
1 Use the table to find the unit rate and write y = kx.

PAGES READ

Minutes (x)	Pages (y)
2	10
4	20
8	40

ANSWER _____

2 Use the graph to find tokens earned per hour. Write y = kx, where x is hours and y is tokens.



ANSWER _____

3 A cyclist travels 16 miles in 2 hours at a steady speed. Find the unit rate in miles per hour.

ANSWER _____

4 For y = 13x, what is the unit rate? What is y when x = 2?

ANSWER _____

5 A player earns 22 points for 2 wins. The points per win stay the same. Find the unit rate and write y = kx, where x is wins and y is points.

ANSWER _____

6 The tape shows the same distance traveled in each hour. Find kilometers per hour and write y = kx, where x is hours and y is kilometers.

Distance	1 hr	1 hr	1 hr	1 hr	**36 km**

ANSWER _____

APPLY IT Show your work

1 A game shop charges $20 for 8 virtual sticker packs. Each pack costs the same amount. What will 10 packs cost? Write y = kx, where x is packs and y is cost in dollars.

WORK SPACE

ANSWER _____

2 A skateboarder travels 32 meters in 8 seconds at a steady speed. How far will the skateboarder travel in 10 seconds? Give the unit rate and write y = kx, where x is seconds and y is meters.

WORK SPACE

ANSWER _____

CHALLENGE One step up

One entry in the table breaks the proportional pattern. Identify and correct it. Then give the unit rate and equation, and explain how you know.

CHECK THE PATTERN

x	y
2	16
4	32
10	78

WORK SPACE AND ANSWER

ANSWER KEY

Find the Rate

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the table to find the unit rate and write y = kx.	**5 pages per minute; y = 5x**
2	Use the graph to find tokens earned per hour. Write y = kx, where x is hours and y is tokens.	**4 tokens per hour; y = 4x**
3	A cyclist travels 16 miles in 2 hours at a steady speed. Find the unit rate in miles per hour.	**8 miles per hour**
4	For y = 13x, what is the unit rate? What is y when x = 2?	**Unit rate: 13; y = 26**
5	A player earns 22 points for 2 wins. The points per win stay the same. Find the unit rate and write y = kx, where x is wins and y is points.	**11 points per win; y = 11x**
6	The tape shows the same distance traveled in each hour. Find kilometers per hour and write y = kx, where x is hours and y is kilometers.	**9 kilometers per hour; y = 9x**

PART 2 · APPLY IT

1. **$25; y = (5/2)x** Divide $20 by 8 to get $5/2 per pack. Multiply by 10 to get $25.
2. **40 meters; 4 meters per second; y = 4x** Divide 32 by 8 to get 4 meters per second. Multiply by 10 to get 40 meters.

CHALLENGE

When x = 10, y should be 80 instead of 78. The other rows give 16/2 = 32/4 = 8, so the unit rate is 8 and y = 8x.

Accept equivalent equations, such as y = 2.5x in the game shop problem. Units should match the quantities named in each problem.