LESSON MAKER PRO

Ratio Reality Check

Test whether two quantities keep the same multiplier.

GRADE 7 · 7.PAR.4.3

7.PAR.4.3 "Determine whether two quantities presented in authentic problems are in a proportional relationship."

NAME _____ DATE _____

THE BIG IDEA

Two quantities are proportional when you can multiply every input by the same constant to get the matching output. Divide each output by its input to find the constant of proportionality. If every quotient is equal, the relationship has the form y = kx.

WORKED EXAMPLE

At a school store, 11 stickers cost $77, and 13 stickers cost $91. Are the number of stickers and the cost proportional?

1. Find the first unit rate: 77 / 11 = 7.
2. Find the second unit rate: 91 / 13 = 7.
3. The unit rates match, so the same multiplier works each time.

Answer: Yes. The cost is 7 times the number of stickers.

PRACTICE 6 problems

1 For x-values 1, 2, and 3, the matching y-values are 3, 6, and 9. Are x and y proportional?

ANSWER _____

2 For x-values 4, 6, and 8, the matching y-values are 18, 27, and 35. Are x and y proportional? Show the ratios you used.

ANSWER _____

3 A student buys 5 game tokens for $20, 9 game tokens for $36, and 12 game tokens for $48. Are the number of tokens and the cost proportional?

ANSWER _____

4 A bike travels 10 miles in 4 hours, 15 miles in 6 hours, and 20 miles in 8 hours. Are distance and time proportional? Explain using unit rates.

ANSWER _____

5 For x-values 3, 5, and 9, the matching y-values are 12, 20, and 36. Determine whether x and y are proportional.

ANSWER _____

6 The relationship is y = 3x + 5. Is y proportional to x? Explain.

ANSWER _____

APPLY IT Show your work

1 A student tests a game reward system. Use the table to determine whether coins earned are proportional to levels completed. If they are proportional, find the number of coins earned for 12 levels.

GAME REWARD TEST

Levels completed	Coins earned
3	24
5	40
9	72

ANSWER _____

2 A club orders custom sticker sheets. Three sheets cost $14, five sheets cost $20, and eight sheets cost $29. Is the cost proportional to the number of sheets?

WORK SPACE

ANSWER _____

CHALLENGE One step up

At a school esports fundraiser, 8 players raise $36, 12 players raise $54, 16 players raise $72, and 20 players raise $88. A student says the first three pairs prove the relationship is proportional. Determine whether all four pairs are proportional. Name the pair that does not fit and explain why checking only the first three pairs is not enough.

WORK SPACE AND ANSWER

ANSWER KEY

Ratio Reality Check

GRADE 7 · 7.PAR.4.3

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For x-values 1, 2, and 3, the matching y-values are 3, 6, and 9. Are x and y proportional?	**Yes, k = 3.**
2	For x-values 4, 6, and 8, the matching y-values are 18, 27, and 35. Are x and y proportional? Show the ratios you used.	**No. 18/4 = 9/2 and 27/6 = 9/2, but 35/8 is different.**
3	A student buys 5 game tokens for $20, 9 game tokens for $36, and 12 game tokens for $48. Are the number of tokens and the cost proportional?	**Yes, k = 4 dollars per token.**
4	A bike travels 10 miles in 4 hours, 15 miles in 6 hours, and 20 miles in 8 hours. Are distance and time proportional? Explain using unit rates.	**Yes. Each unit rate is 5/2 miles per hour.**
5	For x-values 3, 5, and 9, the matching y-values are 12, 20, and 36. Determine whether x and y are proportional.	**Yes, k = 4.**
6	The relationship is y = 3x + 5. Is y proportional to x? Explain.	**No. The added 5 means the relationship is not of the form y = kx.**

PART 2 · APPLY IT

1. **Yes. The relationship is proportional with k = 8 coins per level, so 12 levels earn 96 coins.** Divide coins by levels: 24/3 = 8, 40/5 = 8, and 72/9 = 8. Multiply 12 by 8 to get 96.
2. **No. 14/3, 20/5, and 29/8 are not equal.** Compare the cost per sheet for each order. Since the ratios are different, the cost is not proportional to the number of sheets.

CHALLENGE

No. The first three ratios are 36/8 = 9/2, 54/12 = 9/2, and 72/16 = 9/2, but 88/20 = 22/5. The pair with 20 players and $88 does not fit, so every pair must be checked.

Accept equivalent unit rates and equivalent fractions for proportional relationships. For a nonproportional relationship, accept a correct statement that at least two ratios differ or that the equation has a nonzero added amount.