LESSON MAKER PRO

Rate Check

Decide when two quantities keep the same rate.

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 _____

CHECK THE UNIT RATE

Two quantities are proportional when every pair has the same multiplicative relationship. Divide to find a unit rate for each pair. If the unit rates are equal, the relationship is proportional.

WORKED EXAMPLE

A theater sells 16 tickets for $24 and 18 tickets for $27. Are the number of tickets and the cost proportional?

1. 24/16 = 3/2 dollars per ticket.
2. 27/18 = 3/2 dollars per ticket.
3. The unit rates are equal.

Answer: Yes. The cost is proportional to the number of tickets.

PRACTICE 6 problems

1 A music app charges $9 for 3 downloads and $21 for 7 downloads. Are downloads and cost proportional?

ANSWER _____

2 A runner completes 4 laps in 28 minutes and 6 laps in 39 minutes. Are laps and time proportional?

ANSWER _____

3 A store sells 5 sketchbooks for $35 and 9 sketchbooks for $63. Are sketchbooks and cost proportional?

ANSWER _____

4 A bus charges $5 for 2 rides and $14 for 6 rides. Are rides and cost proportional?

ANSWER _____

5 A print center charges $44 for 11 posters and $60 for 15 posters. Are posters and cost proportional?

ANSWER _____

6 A fundraiser collects $26 from 7 bracelet sales and $35 from 10 bracelet sales. Are bracelets sold and money collected proportional?

ANSWER _____

APPLY IT Show your work

1 At an arcade, 4 game rounds cost 20 tokens. A longer session of 9 rounds costs 45 tokens. Is the number of rounds proportional to the number of tokens? Show how you know.

WORK SPACE

ANSWER _____

2 A school merch shop charges $22 for 4 caps and $47 for 9 caps. Is the number of caps proportional to the total cost? Show how you know.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

An online game records completed quests and coins earned: 2 quests, 13 coins; 5 quests, 31 coins; 8 quests, 49 coins; 11 quests, 67 coins. Are quests completed and coins earned proportional? Explain your reasoning.

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_____

ANSWER KEY

Rate Check

GRADE 7 · 7.PAR.4.3

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A music app charges $9 for 3 downloads and $21 for 7 downloads. Are downloads and cost proportional?	**Yes. 9/3 = 3 and 21/7 = 3, so the unit rate is $3 per download.**
2	A runner completes 4 laps in 28 minutes and 6 laps in 39 minutes. Are laps and time proportional?	**No. 28/4 = 7, but 39/6 = 13/2, so the unit rates are not equal.**
3	A store sells 5 sketchbooks for $35 and 9 sketchbooks for $63. Are sketchbooks and cost proportional?	**Yes. 35/5 = 7 and 63/9 = 7, so the unit rate is $7 per sketchbook.**
4	A bus charges $5 for 2 rides and $14 for 6 rides. Are rides and cost proportional?	**No. 5/2 does not equal 14/6, so the unit rates are not equal.**
5	A print center charges $44 for 11 posters and $60 for 15 posters. Are posters and cost proportional?	**Yes. 44/11 = 4 and 60/15 = 4, so the unit rate is $4 per poster.**
6	A fundraiser collects $26 from 7 bracelet sales and $35 from 10 bracelet sales. Are bracelets sold and money collected proportional?	**No. 26/7 does not equal 35/10, so the unit rates are not equal.**

PART 2 · APPLY IT

1. **Yes. The relationship is proportional because both sessions cost 5 tokens per round.** Find each unit rate: 20/4 = 5 and 45/9 = 5. Since the rates match, the quantities are proportional.
2. **No. 22/4 = 11/2, but 47/9 is not 11/2.** Compare cost per cap. The unit rates are different, so the quantities are not proportional.

CHALLENGE

No. The unit rates are not equal: 13/2, 31/5, 49/8, and 67/11 are different. The pattern is coins = 6 x quests + 1, which includes 1 extra coin and is not proportional.

Accept any correct comparison of equivalent unit rates, including fractions, decimals, or cross-products. For proportional relationships, students may state the constant of proportionality as a unit rate.