

Ratio Reality Check

Use tables, graphs, and situations to test for proportional relationships.

GRADE 7 • MA.7.AR.4.1

MA.7.AR.4.1 "Determine whether two quantities have a proportional relationship by examining a table, graph or written description."

NAME _____

DATE _____

SPOT THE CONSTANT RATIO

Two quantities are proportional when the ratio y/x stays the same for every pair of nonzero values. On a graph, a proportional relationship forms a straight line that passes through the origin.

WORKED EXAMPLE

Do the quantities in this table have a proportional relationship? x: 4, 10
y: 14, 35

1. Find the first ratio: $14/4 = 7/2$.
2. Find the second ratio: $35/10 = 7/2$.
3. The ratios match, so the relationship is proportional.

Answer: Yes. The constant of proportionality is $7/2$.

PRACTICE 6 problems

- 1** Do the quantities in this table have a proportional relationship? x: 3, 6, 9 y: 12, 24, 36

ANSWER _____

- 2** Do the quantities in this table have a proportional relationship? x: 5, 8, 11 y: 15, 24, 34

ANSWER _____

- 3** A game awards 6 tickets for each level you complete. Let x be the number of levels and y be the number of tickets. Are x and y proportional?

ANSWER _____

- 4** A graph includes the points (0, 0), (8, 24), and (16, 48). Does the graph show a proportional relationship?

ANSWER _____

- 5** Do the quantities in this table have a proportional relationship? x: 13, 26, 39 y: 8, 16, 25

ANSWER _____

- 6** A dance studio charges a \$17 registration fee plus \$3 for each session. Is the amount paid proportional to the number of sessions?

ANSWER _____

APPLY IT Show your work

- 1** In a gaming tournament, a team earns 24 tokens after 3 rounds and 40 tokens after 5 rounds. Are the number of tokens and the number of rounds proportional? Explain.

WORK SPACE

ANSWER _____

- 2** A website charges \$9 for each custom phone case and a one-time \$12 shipping fee. Three cases cost \$39, and five cases cost \$57. Is total cost proportional to the number of cases? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Exactly one table shows a proportional relationship. Identify the table and explain your reasoning. Table A x: 8, 16, 24 y: 24, 48, 72 Table B x: 5, 15, 25 y: 18, 54, 91

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Do the quantities in this table have a proportional relationship? x: 3, 6, 9 y: 12, 24, 36	Yes. $y = 4x$.
2	Do the quantities in this table have a proportional relationship? x: 5, 8, 11 y: 15, 24, 34	No. $15/5$ and $24/8$ are 3, but $34/11$ is not 3.
3	A game awards 6 tickets for each level you complete. Let x be the number of levels and y be the number of tickets. Are x and y proportional?	Yes. $y = 6x$.
4	A graph includes the points (0, 0), (8, 24), and (16, 48). Does the graph show a proportional relationship?	Yes. Each nonzero point has $y/x = 3$, and the graph passes through (0, 0).
5	Do the quantities in this table have a proportional relationship? x: 13, 26, 39 y: 8, 16, 25	No. $8/13$ and $16/26$ are equal, but $25/39$ is different.
6	A dance studio charges a \$17 registration fee plus \$3 for each session. Is the amount paid proportional to the number of sessions?	No. The \$17 registration fee means the relationship is $y = 3x + 17$, not $y = kx$.

PART 2 • APPLY IT

- Yes. The team earns 8 tokens per round in both cases.** Compute $24/3 = 8$ and $40/5 = 8$. Since the unit rate is the same, the relationship is proportional.
- No. The one-time \$12 shipping fee means the total cost is not proportional.** Compare $39/3 = 13$ with $57/5$. The ratios are different because the fixed shipping fee is included.

CHALLENGE

Table A is proportional because y/x is 3 for every pair. Table B is not proportional because $18/5 = 54/15$, but $91/25$ is different.

Accept equivalent equations, such as $y = 4x$ or $y/x = 4$, when they correctly describe a proportional relationship. For explanations, accept a correct comparison of unit rates or a correct statement about a fixed starting fee.