Recognizing Proportional Relationships

Explore ideas and representations

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

A proportional relationship has $y = kx$: every nonzero row has the same y/x, and the graph includes $(0, 0)$. For $(2, 6), (4, 12)$ both ratios are 3; $(2, 7), (4, 13)$ have different ratios even though increases are steady.

Worked example

Practice table: does the table show a proportional relationship? Give two ratios as evidence.

1. First row: $y/x = 2/1 = 2$.
2. Second row: $y/x = 6/3 = 2$.
3. Third row gives 2; all ratios agree.
Answer: Yes; $k = 2$.

x	y
1	2
3	6
5	10

Practice Problems

Show your thinking.

1. Ribbon lengths: does the table show a proportional relationship? Give two ratios as evidence.

x	y
1	2
2	4
4	8

2. Delivery charges: does the table show a proportional relationship? Give two ratios as evidence.

x	y
2	6
3	8
5	12

3. Is $y = 4x$ proportional? Test $x = 0$ and compare outputs at $x = 1, 2$.

4. Is $y = 3x + 2$ proportional? Test $x = 0$ and compare outputs at $x = 1, 2$.

5. Is $y = x/2$ proportional? Test $x = 0$ and compare outputs at $x = 1, 2$.

6. Is $y = 7 + x$ proportional? Test $x = 0$ and compare outputs at $x = 1, 2$.

7. Refill station: does the table show a proportional relationship? Give two ratios as evidence.

x	y
2	7
4	14
6	21

8. Delivery membership: does the table show a proportional relationship? Give two ratios as evidence.

x	y
1	4
3	10
5	16

Answer Key

1. Yes; $k = 2$.
2. No; the ratios are different.
3. Proportional.
4. Not proportional.
5. Proportional.
6. Not proportional.
7. Yes; $k = \frac{7}{2}$.
8. No; the ratios are different.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. First row: $y/x = 2/1 = 2$.
2. Second row: $y/x = 4/2 = 2$.
3. Third row gives 2; all ratios agree.

Problem 2

1. First row: $y/x = 6/2 = 3$.
2. Second row: $y/x = 8/3 = \frac{8}{3}$.
3. Third row gives $\frac{12}{5}$; one constant does not fit all rows.

Problem 3

1. At $x = 0$, $y = 0$.
2. At $x = 1, 2$, outputs are $4, 8$.
3. Ratios are 4 and 4; they agree and the origin is included.

Problem 4

1. At $x = 0$, $y = 2$.
2. At $x = 1, 2$, outputs are $5, 8$.
3. Ratios are 5 and 4; they differ and the origin is absent.

Problem 5

1. At $x = 0$, $y = 0$.
2. At $x = 1, 2$, outputs are $\frac{1}{2}, 1$.
3. Ratios are $\frac{1}{2}$ and $\frac{1}{2}$; they agree and the origin is included.

Problem 6

1. At $x = 0$, $y = 7$.
2. At $x = 1, 2$, outputs are $8, 9$.
3. Ratios are 8 and $\frac{9}{2}$; they differ and the origin is absent.

Problem 7

1. First row: $y/x = 7/2 = \frac{7}{2}$.
2. Second row: $y/x = 14/4 = \frac{7}{2}$.
3. Third row gives $\frac{7}{2}$; all ratios agree.

Problem 8

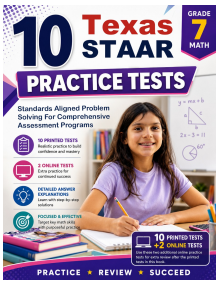
1. First row: $y/x = 4/1 = 4$.
2. Second row: $y/x = 10/3 = \frac{10}{3}$.
3. Third row gives $\frac{16}{5}$; one constant does not fit all rows.

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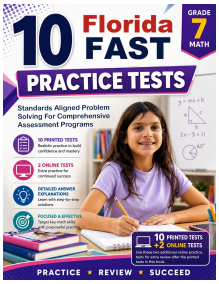
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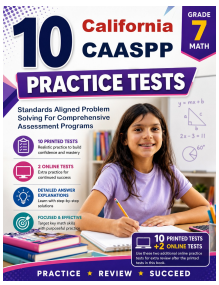
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