What Is a Ratio?

Understanding ratios: Models and calculations

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QUICK REVIEW

A ratio compares counts in a stated order. For 4 blue and 6 gold beads, blue to gold is $4 : 6 = 2 : 3$, but blue to all is $4 : 10 = 2 : 5$. For every 2 blue, there are 3 gold preserves the same order.

Worked example

There are 6 apples and 9 pears. State apples to pears and apples to all.

1. $6 \div 3 = 2$ and $9 \div 3 = 3$, so apples to pears is $2 : 3$.
2. Total fruit: $6 + 9 = 15$.
3. Apples to all is $6 : 15 = 2 : 5$ because $15 \div 3 = 5$.
Answer: $2 : 3$ and $2 : 5$.

Practice Problems

Show your thinking.

1. Use the boxes. Write A to B in simplest form.

B □□□□□

A □□□

2. A tray has 8 red and 12 green grapes. Write red to green and green to red.

3. Of 18 books, 7 are mysteries. Write mysteries to non-mysteries.

4. Write $15 : 25$ as a fraction in simplest form.

5. A team has 10 sixth graders and 5 seventh graders. Is $2 : 1$ sixth to seventh? Show why.

6. Draw a collection with stars to circles $2 : 3$ and 10 shapes altogether.

7. A recipe uses 3 cups oats and 2 cups seeds. Write seeds to all dry ingredients.

8. Which is larger: the red share in 2 red/3 blue or in 3 red/7 blue? Show fractions.

Answer Key

1. $3 : 5$.
2. $2 : 3$; $3 : 2$.
3. $7 : 11$.
4. $\frac{3}{5}$.
5. Yes.
6. 4 stars and 6 circles.
7. $2 : 5$.
8. The first: $\frac{2}{5} > \frac{3}{10}$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Count 3 A boxes and 5 B boxes.
2. $\gcd(3, 5) = 1$, so $3 : 5$ is already simplest.

Problem 2

1. $8 : 12 = (8 \div 4) : (12 \div 4) = 2 : 3$.
2. Reversing the order gives $12 : 8 = 3 : 2$, not $2 : 3$.

Problem 3

1. Non-mysteries: $18 - 7 = 11$.
2. Compare the requested groups: $7 : 11$; their total is $7 + 11 = 18$.

Problem 4

1. $\gcd(15, 25) = 5$.
2. $\frac{15}{25} = \frac{15 \div 5}{25 \div 5} = \frac{3}{5}$.

Problem 5

1. $10 \div 5 = 2$ and $5 \div 5 = 1$.
2. Thus $10 : 5 = 2 : 1$; both counts were divided by 5.

Problem 6

1. One group has $2 + 3 = 5$ shapes.
2. $10 \div 5 = 2$ groups give $2 \times 2 = 4$ stars and $3 \times 2 = 6$ circles.

Problem 7

1. Total dry ingredients: $3 + 2 = 5$ cups.
2. Seeds to total is $2 : 5$; $\gcd(2, 5) = 1$.

Problem 8

1. The first red share is $2/(2 + 3) = 2/5 = 4/10$.
2. The second is $3/(3 + 7) = 3/10$; $4/10 > 3/10$.

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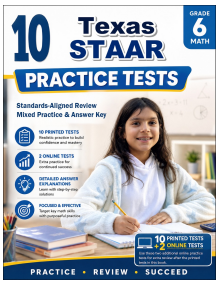

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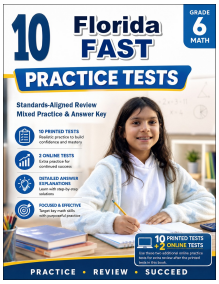

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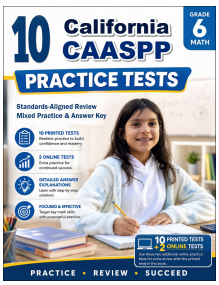

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