Applying Proportional Reasoning to Real-World Problems

Spot mistakes, reason, and work backward

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

QUICK REVIEW

Keep matching quantities in the same order. Multiply both sides of a ratio by one scale factor, or find the unit rate. If 3 cups serve 4 people, 10 people need $(3/4)(10) = 7.5$ cups, not $3 + 6 = 9$ cups.

Worked example

A recipe uses 3 units in 4 serving. Find units per serving.

1. The unit rate is $3 \div 4$.
2. Use the reciprocal: $3 \times \frac{1}{4} = \frac{3}{4}$.
3. Check: $\frac{3}{4} \times 4 = 3$ units.
Answer: $\frac{3}{4}$ units per serving.

Practice Problems

Show your thinking.

1. A recipe uses 3 cups of flour for 2 servings. Sam adds 3 to both values and gets 6 cups of flour for 5 servings. Correct Sam.

2. A garden mix uses 4 kg of seed for 3 beds. Sam adds 3 to both values and gets 7 kg of seed for 6 beds. Correct Sam.

3. A paint mix uses 5 liters of blue for 4 cans. Sam adds 3 to both values and gets 8 liters of blue for 7 cans. Correct Sam.

4. A fundraiser uses 6 dollars for 5 tickets. Sam adds 3 to both values and gets 9 dollars for 8 tickets. Correct Sam.

5. A fabric job uses 7 meters for 6 flags. Sam adds 3 to both values and gets 10 meters for 9 flags. Correct Sam.

6. A water filter uses 8 liters for 7 minutes. Sam adds 3 to both values and gets 11 liters for 10 minutes. Correct Sam.

7. Soup recipe: the rate is $\frac{5}{2}$ kg for 4 groups. Find how many groups $\frac{25}{4}$ kg can serve.

8. Trail supply: the rate is $\frac{9}{4}$ kg for 3 groups. Find how many groups 6 kg can serve.

Answer Key

1. Need $\frac{15}{2}$ cups of flour.
2. Need 8 kg of seed.
3. Need $\frac{35}{4}$ liters of blue.
4. Need $\frac{48}{5}$ dollars.
5. Need $\frac{21}{2}$ meters.
6. Need $\frac{80}{7}$ liters.
7. 10 groups.
8. 8 groups.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Per servings: $3 \div 2 = \frac{3}{2}$ cups of flour.
2. For 5 servings: $\frac{3}{2}(5) = \frac{15}{2}$ cups of flour.
3. Check $\frac{15}{2} \div 5 = \frac{3}{2}$.

Problem 2

1. Per beds: $4 \div 3 = \frac{4}{3}$ kg of seed.
2. For 6 beds: $\frac{4}{3}(6) = 8$ kg of seed.
3. Check $8 \div 6 = \frac{4}{3}$.

Problem 3

1. Per cans: $5 \div 4 = \frac{5}{4}$ liters of blue.
2. For 7 cans: $\frac{5}{4}(7) = \frac{35}{4}$ liters of blue.
3. Check $\frac{35}{4} \div 7 = \frac{5}{4}$.

Problem 4

1. Per tickets: $6 \div 5 = \frac{6}{5}$ dollars.
2. For 8 tickets: $\frac{6}{5}(8) = \frac{48}{5}$ dollars.
3. Check $\frac{48}{5} \div 8 = \frac{6}{5}$.

Problem 5

1. Per flags: $7 \div 6 = \frac{7}{6}$ meters.
2. For 9 flags: $\frac{7}{6}(9) = \frac{21}{2}$ meters.
3. Check $\frac{21}{2} \div 9 = \frac{7}{6}$.

Problem 6

1. Per minutes: $8 \div 7 = \frac{8}{7}$ liters.
2. For 10 minutes: $\frac{8}{7}(10) = \frac{80}{7}$ liters.
3. Check $\frac{80}{7} \div 10 = \frac{8}{7}$.

Problem 7

1. Per group: $\frac{5}{2} \div 4 = \frac{5}{8}$ kg.
2. For 10 groups: $\frac{5}{8}(10) = \frac{25}{4}$ kg.
3. Reverse check: $\frac{25}{4} \div (\frac{5}{8}) = 10$ groups.

Problem 8

1. Per group: $\frac{9}{4} \div 3 = \frac{3}{4}$ kg.
2. For 8 groups: $\frac{3}{4}(8) = 6$ kg.
3. Reverse check: $6 \div (\frac{3}{4}) = 8$ groups.

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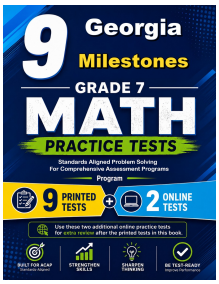

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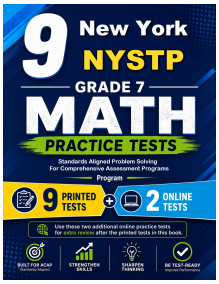

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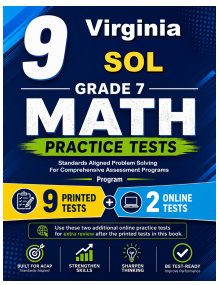

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