Applying Proportional Reasoning to Real-World Problems

Apply the skill to decisions and designs

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 needs 3 cups of flour per 2 servings. You have 8 cups of flour. Is this enough for 6 servings? Find the extra amount.

2. A garden mix needs 4 kg of seed per 3 beds. You have $\frac{25}{3}$ kg of seed. Is this enough for 7 beds? Find the extra amount.

3. A paint mix needs 5 liters of blue per 4 cans. You have 9 liters of blue. Is this enough for 8 cans? Find the extra amount.

4. A fundraiser needs 6 dollars per 5 tickets. You have $\frac{49}{5}$ dollars. Is this enough for 9 tickets? Find the extra amount.

5. A fabric job needs 7 meters per 6 flags. You have $\frac{32}{3}$ meters. Is this enough for 10 flags? Find the extra amount.

6. A water filter needs 8 liters per 7 minutes. You have $\frac{81}{7}$ liters. Is this enough for 11 minutes? Find the extra amount.

7. Soup recipe: $\frac{5}{2}$ kg serves 4 groups. Compare 6 kg available with the amount needed for 10 groups.

8. Trail supply: $\frac{9}{4}$ kg serves 3 groups. Compare $\frac{23}{4}$ kg available with the amount needed for 8 groups.

Answer Key

1. Need 9 cups of flour. Add 1 cups of flour.
2. Need $\frac{28}{3}$ kg of seed. Add 1 kg of seed.
3. Need 10 liters of blue. Add 1 liters of blue.
4. Need $\frac{54}{5}$ dollars. Add 1 dollars.
5. Need $\frac{35}{3}$ meters. Add 1 meters.
6. Need $\frac{88}{7}$ liters. Add 1 liters.
7. Short by $1/4$ kg.
8. Short by $1/4$ kg.

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 6 servings: $\frac{3}{2}(6) = 9$ cups of flour.
3. Shortage: $9 - (8) = 1$ cups of flour.

Problem 2

1. Per beds: $4 \div 3 = \frac{4}{3}$ kg of seed.
2. For 7 beds: $\frac{4}{3}(7) = \frac{28}{3}$ kg of seed.
3. Shortage: $\frac{28}{3} - (\frac{25}{3}) = 1$ kg of seed.

Problem 3

1. Per cans: $5 \div 4 = \frac{5}{4}$ liters of blue.
2. For 8 cans: $\frac{5}{4}(8) = 10$ liters of blue.
3. Shortage: $10 - (9) = 1$ liters of blue.

Problem 4

1. Per tickets: $6 \div 5 = \frac{6}{5}$ dollars.
2. For 9 tickets: $\frac{6}{5}(9) = \frac{54}{5}$ dollars.
3. Shortage: $\frac{54}{5} - (\frac{49}{5}) = 1$ dollars.

Problem 5

1. Per flags: $7 \div 6 = \frac{7}{6}$ meters.
2. For 10 flags: $\frac{7}{6}(10) = \frac{35}{3}$ meters.
3. Shortage: $\frac{35}{3} - (\frac{32}{3}) = 1$ meters.

Problem 6

1. Per minutes: $8 \div 7 = \frac{8}{7}$ liters.
2. For 11 minutes: $\frac{8}{7}(11) = \frac{88}{7}$ liters.
3. Shortage: $\frac{88}{7} - (\frac{81}{7}) = 1$ liters.

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. Shortage $\frac{25}{4} - (6) = \frac{1}{4}$ kg, so the supply is insufficient.

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. Shortage $6 - (\frac{23}{4}) = \frac{1}{4}$ kg, so the supply is insufficient.

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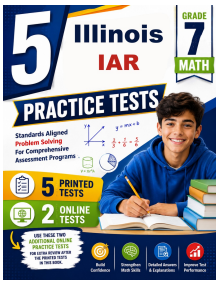

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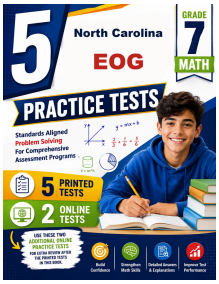

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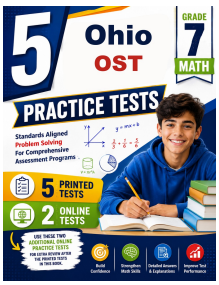

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