Solving Rate and Ratio Word Problems

Rate and ratio word problems: Applications and decisions

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

Choose a ratio or a rate model from the units. For red:blue $= 2:3$ and 20 tiles, there are 5 parts, $20/5 = 4$ per part, so 8 red and 12 blue. For 12 km in 3 h, use $12/3 = 4$ km/h.

Worked example

Mix juice and water in ratio $3:5$ for 24 cups. Find each amount.

1. $3 + 5 = 8$ parts; $24 \div 8 = 3$ cups per part.
2. Juice $= 3 \times 3 = 9$ cups; water $= 5 \times 3 = 15$ cups.
Answer: 9 cups juice; 15 cups water.

Practice Problems

Show your thinking.

1. A 48-cup mix needs oats:nuts $= 5:3$. Only 16 cups nuts are available. Can the batch be made?

2. A 42-km trip must finish in 3 hours. A cyclist averages 12 km/h. Is that sufficient?

3. Paint needs blue:white $= 2:3$. There are 6 L blue and 12 L white. Keep all blue. How much white is used?

4. 6 muffins cost 9 dollars, or 10 muffins cost 14 dollars. Find the cheaper cost for exactly 30 muffins.

5. A map route is 8 cm and the scale is 3 km per cm. At 6 km/h, find travel time.

6. A club needs 1 supervisor for every 8 students. There are 35 students. How many supervisors are needed?

Answer Key

1. No; 18 cups nuts are needed, a shortage of 2.
2. No; 14 km/h is needed.
3. 9 L white; 3 L left.
4. 42 dollars using the 10-packs.
5. 4 hours.
6. 5 supervisors.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. $48/(5+3) = 6$ cups per part.
2. Nuts needed $= 3 \times 6 = 18$ cups; shortage $= 18 - 16 = 2$ cups.

Problem 2

1. Required speed $= 42/3 = 14$ km/h.
2. At 12 km/h, distance $= 12 \times 3 = 36$ km; 6 km short.

Problem 3

1. $6/2 = 3$ batches need $3 \times 3 = 9$ L white.
2. White left $= 12 - 9 = 3$ L.

Problem 4

1. Five 6-packs cost $5 \times 9 = 45$ dollars.
2. Three 10-packs cost $3 \times 14 = 42$ dollars, saving 3.

Problem 5

1. Distance $= 8 \times 3 = 24$ km.
2. Time $= 24/6 = 4$ hours.

Problem 6

1. $35/8 = 4\frac{3}{8}$, so 4 supervisors cover only $4 \times 8 = 32$ students.
2. One more is needed: $5 \times 8 = 40 \geq 35$, so use 5.

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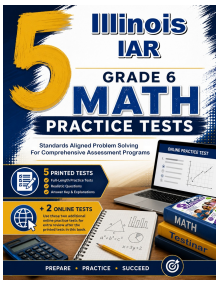

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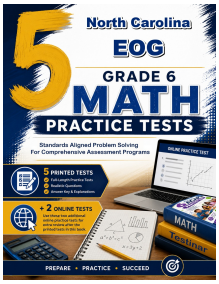

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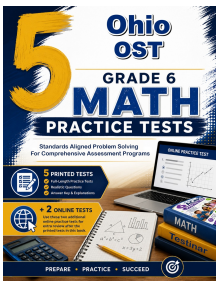

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