Multiples of a Fraction

Apply the skill to decisions and designs

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

QUICK REVIEW

Positive multiples of a fraction are $1, 2, 3, \ldots$ copies. For $\frac{1}{6}$, they begin $\frac{1}{6}, \frac{2}{6}, \frac{3}{6}$. With a step of $\frac{a}{b}$, each new multiple adds a pieces of size $\frac{1}{b}$.

Worked example

List the first four positive multiples of $\frac{2}{9}$.

1. Multiply the fraction by $1, 2, \ldots, 4$ in order. Each new step adds one more $\frac{2}{9}$.
2. $1 \times \frac{2}{9} = \frac{2}{9}$; $2 \times \frac{2}{9} = \frac{4}{9}$.
3. $3 \times \frac{2}{9} = \frac{6}{9}$; $4 \times \frac{2}{9} = \frac{8}{9}$.
Answer: $\frac{2}{9}, \frac{4}{9}, \frac{2}{3}, \frac{8}{9}$.

Practice Problems

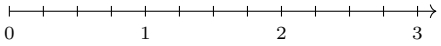
Show your thinking.

1. A track has $\frac{2}{3}$-km laps. Give the distances after laps 1 through 4.

2. Each flag strip is $\frac{3}{5}$ m. List the lengths for $1, 2, 3$ strips.

3. A bottle holds $\frac{5}{8}$ L. List totals for $1, 2, 3, 4$ bottles.

4. Start at 0 and show four $\frac{3}{4}$-m jumps to the right. Give the landing points.



5. A lap chart for $\frac{3}{8}$ km lists $\frac{3}{8}, \frac{6}{8}, \frac{9}{8}, \frac{13}{8}$. Fix the fourth lap total.

6. Design a 3-m border from equal $\frac{3}{5}$-m pieces. Which multiple reaches 3 m?

7. Can 4 equal $\frac{5}{6}$-L fills fit in a 3-L tank? Find the extra or spare capacity.

8. Explain why the fourth multiple of $\frac{2}{5}$ is twice its second multiple.

Answer Key

1. $\frac{2}{3}$ km, $1\frac{1}{3}$ km, 2 km, $2\frac{2}{3}$ km.
2. $\frac{3}{5}$ m, $1\frac{1}{5}$ m, $1\frac{4}{5}$ m.
3. $\frac{5}{8}$ L, $1\frac{1}{4}$ L, $1\frac{7}{8}$ L, $2\frac{1}{2}$ L.
4. $\frac{3}{4}$ m, $1\frac{1}{2}$ m, $2\frac{1}{4}$ m, 3 m.
5. $\frac{12}{8} = 1\frac{1}{2}$ km.
6. 5.
7. No; $\frac{1}{3}$ L too much.
8. $\frac{8}{5}$ is twice $\frac{4}{5}$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Multiply the fraction by $1, 2, \ldots, 4$ in order. Each new step adds one more $\frac{2}{3}$ km.
2. $1 \times \frac{2}{3} = \frac{2}{3}$ km; $2 \times \frac{2}{3} = \frac{4}{3}$ km.
3. $3 \times \frac{2}{3} = \frac{6}{3}$ km; $4 \times \frac{2}{3} = \frac{8}{3}$ km.

Problem 2

1. Multiply the fraction by $1, 2, \ldots, 3$ in order. Each new step adds one more $\frac{3}{5}$ m.
2. $1 \times \frac{3}{5} = \frac{3}{5}$ m; $2 \times \frac{3}{5} = \frac{6}{5}$ m.
3. $3 \times \frac{3}{5} = \frac{9}{5}$ m.

Problem 3

1. Multiply the fraction by $1, 2, \ldots, 4$ in order. Each new step adds one more $\frac{5}{8}$ L.
2. $1 \times \frac{5}{8} = \frac{5}{8}$ L; $2 \times \frac{5}{8} = \frac{10}{8}$ L.
3. $3 \times \frac{5}{8} = \frac{15}{8}$ L; $4 \times \frac{5}{8} = \frac{20}{8}$ L.

Problem 4

1. Multiply the fraction by $1, 2, \ldots, 4$ in order. Each new step adds one more $\frac{3}{4}$ m.
2. $1 \times \frac{3}{4} = \frac{3}{4}$ m; $2 \times \frac{3}{4} = \frac{6}{4}$ m.
3. $3 \times \frac{3}{4} = \frac{9}{4}$ m; $4 \times \frac{3}{4} = \frac{12}{4}$ m.

Problem 5

1. The third total is $\frac{9}{8}$ km.
2. Add the lap length: $\frac{9}{8} + \frac{3}{8} = \frac{12}{8}$ km.
3. $4 \times \frac{3}{8} = \frac{12}{8}$ checks the repair.

Problem 6

1. The target is $3 = \frac{15}{5}$ m.
2. Each piece contributes 3 fifths; $15 \div 3 = 5$.
3. The fifth multiple is $5 \times \frac{3}{5} = 3$ m.

Problem 7

1. Four fills give $4 \times \frac{5}{6} = \frac{20}{6} = 3\frac{1}{3}$ L.
2. The tank holds $3 = \frac{18}{6}$ L.
3. $\frac{20}{6} - \frac{18}{6} = \frac{2}{6} = \frac{1}{3}$ L extra.

Problem 8

1. The second multiple is $2 \times \frac{2}{5} = \frac{4}{5}$.
2. The fourth is $4 \times \frac{2}{5} = \frac{8}{5}$.
3. Two copies of $\frac{4}{5}$ give $2 \times \frac{4}{5} = \frac{8}{5}$.

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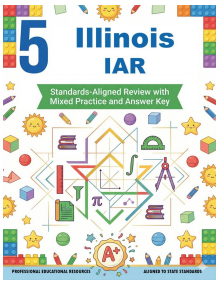

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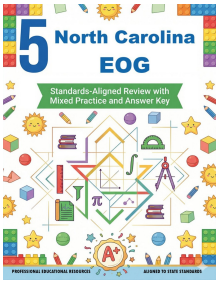

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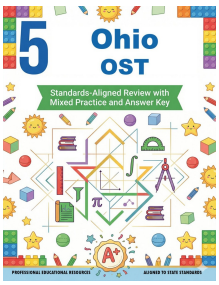

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