Practice

Check

4. Which operation do you do first?

a) $\frac{1}{3} \times (\frac{7}{8} - \frac{3}{4})$

b) $\frac{7}{8} \div (\frac{1}{3} \times \frac{1}{8})$

c) $\frac{9}{5} \times (\frac{3}{5} \div \frac{1}{10})$

d) $(\frac{5}{3} + \frac{7}{12}) \times \frac{4}{9}$

5. Raj and Rena evaluated this expression:
$\frac{5}{9} + \frac{2}{3} \times \frac{1}{2}$

Raj got $\frac{8}{9}$. Rena got $\frac{11}{18}$. Who is correct? What mistake did the other person make?

6. Evaluate. Which operation is done first?

a) $\frac{1}{2} \times \frac{3}{5} + \frac{1}{4}$

b) $\frac{2}{3} + \frac{5}{6} \div \frac{1}{2}$

c) $\frac{4}{5} \div \frac{7}{10} + \frac{1}{3}$

d) $\frac{1}{4} \times (\frac{11}{12} - \frac{5}{6})$

e) $\frac{1}{2} \times (\frac{4}{5} \div \frac{3}{10})$

f) $(\frac{3}{5} + \frac{7}{15}) \times \frac{5}{6}$

Apply

7. Evaluate. Show all steps.

a) $\frac{1}{8} \times \frac{3}{4} \times \frac{7}{5} \div \frac{7}{10}$

b) $\frac{14}{15} \div \frac{2}{3} \times \frac{5}{8} + \frac{3}{4}$

c) $\frac{2}{3} - \frac{1}{4} + \frac{1}{2} \div \frac{2}{5}$

d) $\frac{5}{6} - \frac{1}{5} \times \frac{5}{8} + \frac{2}{3}$

8. Emma thinks that the expressions $1\frac{1}{2} \div \frac{1}{4} \times \frac{2}{3}$ and $1\frac{1}{2} \div (\frac{1}{4} \times \frac{2}{3})$ have the same value. Is Emma correct? Explain.

9. Evaluate.

a) $\frac{7}{10} - (\frac{1}{5} + \frac{1}{4}) \times \frac{2}{3}$

b) $(\frac{1}{4} + \frac{5}{6} - \frac{1}{3}) \times \frac{8}{5}$

c) $(\frac{6}{5} + \frac{4}{10}) \times (\frac{3}{8} - \frac{1}{16})$

10. Evaluate.

a) $\frac{5}{2} + \frac{1}{4} \times \frac{4}{5} \div \frac{1}{10} - \frac{1}{2}$

b) $\frac{4}{9} \times (\frac{2}{3} - \frac{1}{6}) - \frac{1}{8} \times \frac{4}{3}$

11. **Assessment Focus** Robert, Myra, and Joe evaluated this expression:
$4 \times (\frac{3}{4} - \frac{1}{2}) + \frac{13}{6} \times \frac{1}{2}$

Robert's answer was $5\frac{1}{3}$, Myra's answer was $2\frac{1}{12}$, and Joe's answer was $4\frac{5}{6}$.

a) Who had the correct answer? How do you know?

b) Show and explain how the other two students got their answers. Where did they go wrong?

12. **Take It Further** Evaluate.

a) $\frac{14}{15} \div 4\frac{2}{3} \times \frac{5}{8} + 2\frac{3}{4}$

b) $3\frac{2}{3} - 2\frac{1}{4} + \frac{1}{2} \div 2\frac{2}{5}$

c) $8\frac{7}{10} - (2\frac{1}{5} + 2\frac{1}{4}) \times \frac{2}{3}$

Reflect

Write an expression that contains fractions and three operations.
Talk to a partner. Discuss the steps you would follow to evaluate the expression.

Example 1

Evaluate: $\frac{5}{16} - \frac{3}{8} \times \frac{2}{3}$

A Solution

$\frac{5}{16} - \frac{3}{8} \times \frac{2}{3}$ Multiply. Simplify first.

$= \frac{5}{16} - \frac{\cancel{3}^{1}}{\cancel{8}_{4}} \times \frac{\cancel{2}^{1}}{\cancel{3}_{1}}$

$= \frac{5}{16} - \frac{1}{4}$ Use common denominators to subtract.

$= \frac{5}{16} - \frac{4}{16}$

$= \frac{1}{16}$

Example 2

Evaluate: $\frac{3}{4} - \frac{2}{3} \div \frac{4}{5} \times (\frac{1}{8} + \frac{1}{4})$

A Solution

$\frac{3}{4} - \frac{2}{3} \div \frac{4}{5} \times (\frac{1}{8} + \frac{1}{4})$ First do the operation in brackets. Use common denominators to add.

$= \frac{3}{4} - \frac{2}{3} \div \frac{4}{5} \times (\frac{1}{8} + \frac{2}{8})$

$= \frac{3}{4} - \frac{2}{3} \div \frac{4}{5} \times (\frac{3}{8})$ Divide and multiply from left to right.

$= \frac{3}{4} - \frac{\cancel{2}^{1}}{3} \times \frac{5}{\cancel{4}_{2}} \times (\frac{3}{8})$ To divide by $\frac{4}{5}$, multiply by $\frac{5}{4}$. Simplify first.

$= \frac{3}{4} - \frac{5}{\cancel{6}_{2}} \times \frac{\cancel{3}^{1}}{8}$ Multiply. Simplify first.

$= \frac{3}{4} - \frac{5}{16}$ Use common denominators to subtract.

$= \frac{12}{16} - \frac{5}{16}$

$= \frac{7}{16}$

Discuss the ideas

1. A student suggested that brackets should be put around $\frac{3}{8} \times \frac{2}{3}$ in *Example 1*. What is your response to this sugg
2. Why are the brackets necessary in *Example 2*?
3. Do you think most people would get the skill-testing qu in the introduction correct? If not, what answer do you they would give?