Objective 1: Add and subtract fractions with the same denominator

- To add or subtract fractions with the same denominator
  - Add or subtract the numerators and keep the same denominator
  - Simplify

\[
\frac{1}{8} + \frac{3}{8} =
\]

\[
\frac{8}{5} - \frac{2}{5} =
\]

\[
-\frac{3}{10} + \frac{1}{10} =
\]

Objective 2: Add and subtract rational expressions with the same denominator

- To add and subtract rational expressions with the same denominator, we follow the same procedure as for numeric fractions
- Remember, you can only add or subtract like terms

\[
\frac{3x}{10} + \frac{x}{10} =
\]

\[
\frac{x}{3} - \frac{2}{3} =
\]

\[
\frac{3x^2 - 2x + 3}{10} - \frac{2x - 7}{10} =
\]
Objective 3: Add and subtract fractions with different denominators

- To add and subtract fractions with different denominators
  - Write the fractions as equivalent fractions with a common denominator
  - Add or subtract the numerator and keep the denominator the same
  - Simplify

\[
\frac{7}{12} + \frac{2}{15} = \]

Objective 4: Add and subtract rational expressions with different denominators

- To add and subtract rational expressions with different denominators, we follow the same procedure as for numeric fractions
- Remember, you can still only add or subtract like terms

\[
\frac{2x}{3} + \frac{3}{x} = \]

\[
\frac{3}{x-k} - \frac{5}{x-k^2} = \]

Objective 5: Add and subtract mixed numbers

- To add or subtract mixed numbers, write them as improper fractions and then follow the rules for adding/subtracting fractions

\[
\frac{1}{2} + \frac{2}{5} = \]

\[
7\frac{1}{4} - 2\frac{5}{6} = \]
Objective 6: Add and subtract negative mixed numbers

- To add or subtract negative mixed numbers, write them as equivalent addition statements.
- Then, write them as improper fractions and then follow the rules for adding/subtracting fractions.

\[
-9 \frac{1}{6} - (\overline{-2 \frac{1}{2}}) =
\]

Objective 7: Solve equations

- To solve equations with fractions being added/or subtracted to a variable, use the addition/subtraction principle of equality to clear fraction terms and get the variable by itself.

\[
\frac{x}{3} + \frac{3}{8} = \frac{5}{6}
\]

Objective 8: Solve applications

- Remember to look for key words that signal addition and/or subtraction.
  - **Addition** – Add, plus, sum, total, increased by, more than, in all, altogether, perimeter
  - **Subtraction** – Subtract, minus, remove, decreased by, difference, take away, left, less