Math 95, Section 6.2 continued. More addition and subtraction of rational expressions and solving for a variable in a formula.

To build the Lowest Common Denominator:
1. Factor each denominator.
2. To build the LCD, use all the necessary factors but no extras!
3. Multiply each fraction by a well chosen form of \( \frac{f(x)}{f(x)} \) to get equivalent fractions with the same denominator—don’t reduce here!
4. Keep the common denominator. Add or subtract the numerators.
5. Simplify if possible.

Ex. 1: \( \frac{x - 1}{x} + \frac{5}{x+5} \)

\[
\frac{(x+5)(x-1)}{x(x+5)} + \frac{5x}{x(x+5)}
\]

\[
\frac{x^2 + 4x - 5}{x(x+5)} + \frac{5x}{x(x+5)}
\]

\[
\frac{x^2 + 9x - 5}{x(x+5)}
\]

Ex. 2: \( \frac{x}{2x+4} - \frac{x+1}{2x} \)

\[
\frac{x^2}{2x(x+2)} - \frac{(x+1)(x+2)}{2x(x+2)}
\]

\[
\frac{x^2 - (x^2 + 3x + 2)}{2x(x+2)}
\]

\[
\frac{x^2 - x^2 - 3x - 2}{2x(x+2)}
\]

\[
\frac{-3x - 2}{2x(x+2)}
\]
Ex. 3: \[ \frac{1}{x^2 - 3x + 2} - \frac{1}{x^2 - x - 2} = \frac{(x-2)(x-1)}{(x-2)(x+1)} \]

\[ \frac{1}{(x-1)(x-2)(x+1)} - \frac{1}{(x-1)(x-2)(x+1)} = \frac{x+1 - x - 1}{(x-1)(x-2)(x+1)} = \frac{2}{(x-1)(x-2)(x+1)} \]

Ex. 4: \[ \frac{x^2}{x^2 - 9} - \frac{3}{x^2 - 4x + 3} \]

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Ex. 5: \[
\frac{x+1}{x^2+x-12} + \frac{2x-1}{x^2+6x+8}
\]

Ex. 6: \[
\frac{9x+2}{3x^2-2x-8} + \frac{7}{3x^2+x-4}
\]
Ex. 7: \[ \frac{5}{3x-6} - \frac{x}{x-2} + \frac{3+2x}{5x-10} \]

Solving for a Variable: More practice with formulas.

1. Isolate the term(s) with the variable on one side.
2. Factor if necessary.
3. Solve for the appropriate variable.

Ex. 8: Solve for C. \[ 2\pi \cdot r = \frac{C}{2\pi} \cdot \frac{\pi}{1} \]

\[ C = \frac{2\pi r}{\pi} \]
Ex. 9: Solve for \( d \):
\[
\frac{d}{b} \cdot \frac{a}{b} = \frac{c}{a} \cdot \frac{d}{a} \]
\[
\frac{b}{a} \cdot \frac{d}{b} = \frac{c \cdot b}{a}
\]
\[
d = \frac{c \cdot b}{a}
\]

Ex. 10: Solve for \( p \):
\[
A = p + pr\]

Ex. 11: Solve for I: \[ IR + Ir = E \]

Ex. 12: Solve for x: \[ Ax + By = C \]