

8-2 Adding & Subtracting Rational Expressions

- find LCM of rational expressions.
- add and subtract rational expressions.
- A.APR.7

Examples with Fractions

1. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$

LCD = 15

$\frac{5 \cdot 2}{5 \cdot 7} + \frac{1 \cdot 3}{1 \cdot 7} = \frac{10}{15} + \frac{3}{15} = \frac{13}{15}$

Adding & Subtracting Rational Expressions

- factor each denominator.
- find the LCD.
- multiply each fraction by the missing factor(s) of the new LCD.
- add/subtract numerators. (*combine like terms*).

Add or subtract the following rational expressions.

$$1. \frac{9}{b \cdot 10a} - \frac{4a \cdot 2a}{5b \cdot 2a}$$

LCD = 10ab

$$\frac{9b}{LCD} - \frac{8a^2}{LCD}$$

$$\frac{9b - 8a^2}{10ab}$$

$$\frac{(y+3)(3y+1)}{2y-10} + \frac{1 \cdot 2}{y^2-2y-15}$$

LCD: $2(y-5)(y+3)$

$$\frac{3y^2 + 10y + 3}{LCD} + \frac{2}{LCD}$$

$$\frac{3y^2 + 10y + 5}{2(y-5)(y+3)}$$

Add or subtract the following rational expressions.

$$3. \frac{(x+1)}{x^2-9} - \frac{(x+5)}{2x-6}$$

LCD: $2(x+3)(x-3)$

$$\frac{2x+2}{LCD} - \frac{(x^2+8x+15)}{LCD}$$

$$\frac{2x+2 - x^2 - 8x - 15}{LCD}$$

$$\frac{-x^2 - 6x - 13}{2(x+3)(x-3)}$$

$$4. \frac{2}{a+7} + \frac{5}{-(a+7)}$$

$$\frac{2}{a+7} - \frac{5}{a+7}$$

$$\frac{-3}{a+7}$$

$$\begin{array}{r} 3 \overline{) -1 -6 -13} \\ \underline{ -3 -27} \\ -1 -9 \end{array}$$

$$\begin{array}{r} -3 \overline{) -1 -6 -13} \\ \underline{ 3 0} \\ -1 -9 \end{array}$$

Complex Fractions:

Method 1

simplify numerator & denominator, then divide.

5a. $\frac{\frac{2}{x} - \frac{1 \cdot x}{1 \cdot x}}{\frac{x \cdot 1}{x \cdot y} - \frac{3 \cdot y}{x \cdot y}}$

LCM: x

$$\frac{\frac{2}{x} - \frac{x}{x}}{\frac{(x-3y)}{xy}}$$

LCM: xy

$$\frac{\frac{x}{xy} - \frac{3y}{xy}}{\frac{(x-3y)}{xy}}$$

$$\frac{y(2-x)}{(x-3y)}$$

Method 2

find the LCD of all denominators and multiply numerator & denominator by LCD.

5b. $\frac{\frac{2}{x} - \frac{1}{1}}{\frac{1}{y} - \frac{3}{x}}$

LCM: xy

$$\frac{\frac{2xy}{xy} - \frac{xy}{xy}}{\frac{xy}{xy} - \frac{3xy}{xy}}$$

$$\frac{2y - xy}{xy - 3xy}$$

$$\frac{2y - xy}{(x-3y)}$$

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Attachments

9-1HW.notebook