

OBJECTIVE 1: Adding & Subtracting Rational Expressions with Unlike Denominators

STEPS:

1. Find the LCD
2. Restrict the domain (what can the denominator not be)
3. Make equivalent fractions by multiplying the numerator by what is missing in the denominator to match the LCD
4. If subtraction, distribute the - 1 and add the numerators while keeping the denominators. If addition, add the numerators and keep the denominators.
5. Simplify once you have one fraction if anything can be GCF or factored.

TASK 1: Perform each indicated operation. State your LCD. Restrict the domain. Simplify completely.

a) $\frac{2}{3} - \frac{a}{4} - \frac{2a}{8}$

LCD: 8
D: $(-\infty, \infty)$

$\frac{2a}{8} - \frac{2a}{8} = \frac{0}{8} = 0$

b) $\frac{5}{10x^2} + \frac{7}{25x}$

LCD: $50x^2$
D: $(-\infty, 0) \cup (0, \infty)$

$\frac{15 + 14x}{LCD} = \frac{14x + 15}{50x^2}$

c) $\frac{7}{8a} + \frac{5}{12a^2}$

LCD: $24a^2$
D: $(-\infty, 0) \cup (0, \infty)$

$\frac{21a + 10}{24a^2}$

TASK 2: Perform each indicated operation. State your LCD. Restrict the domain. Simplify completely.

a) $\frac{6x}{x^2-4} + \frac{-3}{x+2}$

LCD: $(x+2)(x-2)$
D: $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$

$\frac{6x - 3(x-2)}{LCD} = \frac{6x - 3x + 6}{LCD}$

$\frac{3x + 6}{LCD} = \frac{3(x+2)}{(x+2)(x-2)} = \frac{3}{x-2}$

b) $\frac{12x}{x^2-25} + \frac{-6}{x+5}$

LCD: $(x+5)(x-5)$
D: $(-\infty, -5) \cup (-5, 5) \cup (5, \infty)$

$\frac{12x - 6(x-5)}{LCD} = \frac{12x - 6x + 30}{LCD}$

$\frac{6x + 30}{LCD} = \frac{6(x+5)}{(x+5)(x-5)} = \frac{6}{x-5}$

c) $\frac{2}{3t} + \frac{5}{t+1}$

LCD: $3t(t+1)$
D: $(-\infty, -1) \cup (-1, 0) \cup (0, \infty)$

$\frac{2(t+1) + 5(3t)}{LCD} = \frac{2t + 2 + 15t}{LCD}$

$\frac{17t + 2}{3t(t+1)}$

TASK 3: Perform each indicated operation. State your LCD. Restrict the domain. Simplify completely.

a) $\frac{(y+1)}{3} + \frac{(5y)}{y+1}$
 LCD: $5y(y+1)$
 D: $(-\infty, -1) \cup (-1, 0) \cup (0, \infty)$

$\frac{3(y+1) + 2(5y)}{LCD}$

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

$\frac{13y+3}{5y(y+1)}$

b) $\frac{7}{x-3} + \frac{9}{3-x}$

LCD: $x-3$
 D: $(-\infty, 3) \cup (3, \infty)$

$\frac{7+9}{x-3}$

$\frac{16}{x-3}$

c) $\frac{6}{x-5} + \frac{7}{5-x}$

LCD: $x-5$
 D: $(-\infty, 5) \cup (5, \infty)$

$\frac{6+7}{x-5}$

$\frac{13}{x-5}$

Common Mistakes:

- LCD 1st

- Domain restriction is always LCD $\neq 0$

- Don't cancel or reduce until VERY END! one fraction.

Still need help with: