

OBJECTIVE 1: Complex Fractions

STEPS:

1. Factor everything that is factorable
2. Treat the numerator & denominator of the GIANT fraction as separate problems
3. Find an LCD for the denominator of the numerator and LCD for the denominator of the denominator
4. Now that you have the LCD, multiply the individual terms by whatever is missing from the LCD
5. Perform the indicated operation for the numerator & denominator of the GIANT fraction
6. Instead of multiple fractions in a GIANT fraction, now you should have one fraction in the numerator and one fraction in the denominator
7. KEEP. CHANGE. FLIP (KCF): Keep the fraction in the numerator, change the GIANT division into multiplication, and flip the fraction that was in the denominator of the GIANT fraction
8. Multiply straight across
9. Factor or GCF if possible
10. Simplify anything (REMEMBER ALL OR NOTHING)

TASK 1: Simplify the complex fractions.

$$\begin{aligned} \frac{\frac{x}{6} - \frac{x(2)}{3}}{\frac{5}{7} - \frac{10}{10}} &= \frac{\frac{x-2x}{6}}{\frac{2x-7}{10}} \\ &= \frac{x-2x}{6} \cdot \frac{10}{2x-7} \\ &= \frac{-x}{6} \cdot \frac{10}{2x-7} \\ &= \frac{-10x}{3(2x-7)} \end{aligned}$$

D: $(-\infty, \frac{7}{2}) \cup (\frac{7}{2}, \infty)$

$$\boxed{\frac{-5x}{3(2x-7)}}$$

$$\boxed{\frac{-2(2x-1)}{3x+2}}$$

$$\frac{\frac{2-4x}{x}}{\frac{2+3x}{x}} = \frac{2-4x}{x} \cdot \frac{x}{2+3x} = \frac{-4x+2}{3x+2}$$

$$\frac{\frac{2-4(x)}{x}}{\frac{2+3(x)}{x}} = \frac{2-4x}{x} \cdot \frac{x}{2+3x} = \frac{-4x+2}{3x+2}$$

LCD: x D: $(-\infty, 0) \cup (0, \infty) \rightarrow (-\infty, -\frac{2}{3}) \cup (-\frac{2}{3}, 0) \cup (0, \infty)$

c)
$$\frac{\frac{6}{x-2}}{\frac{1}{x-2} + \frac{3(x-2)}{x}} = \frac{\frac{6}{x-2}}{\frac{x+3(x-2)}{x(x-2)}} = \frac{\frac{6}{x-2}}{\frac{x+3x-6}{x(x-2)}} = \frac{\frac{6}{x-2}}{\frac{4x-6}{x(x-2)}} = \frac{6}{x-2} \cdot \frac{x(x-2)}{4x-6} = \frac{6^3}{x-2} \cdot \frac{x(x-2)}{4x-6} = \frac{3x}{2x-3}$$

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

$D: (-\infty, 0) \cup (0, \frac{3}{2}) \cup (\frac{3}{2}, 2) \cup (2, \infty)$
 $U(\frac{3}{2}, 2) \cup (2, \infty)$

d)
$$\frac{\frac{3}{x+5}}{\frac{2}{x-3} + \frac{1}{x+5}} = \frac{\frac{3}{x+5}}{\frac{2(x+5) + 1(x-3)}{(x-3)(x+5)}} = \frac{\frac{3}{x+5}}{\frac{2x+10+x-3}{(x-3)(x+5)}} = \frac{3}{x+5} \cdot \frac{(x-3)(x+5)}{3x+7} = \frac{3(x-3)}{3x+7}$$

$LCD: (x-3)(x+5)$
 $D: (-\infty, -5) \cup (-5, 3) \cup (3, \infty)$
 $U(3, \infty)$

$D: (-\infty, -5) \cup (-5, -\frac{7}{3}) \cup (-\frac{7}{3}, 3) \cup (3, \infty)$
 $U(-\frac{7}{3}, 3) \cup (3, \infty)$

Common mistakes:

Still need help with: