

COMPLEX FRACTIONS

Steps:

1. Find the LCD of each little denominator in the fraction
2. Multiply EVERY term in the big fraction by the LCD
3. Reduce if possible

Example:

$$\frac{\frac{1}{x} + \frac{1}{y}}{\frac{2}{y} + \frac{1}{x}} = \text{LCD is } xy = \frac{xy\left(\frac{1}{x}\right) + xy\left(\frac{1}{y}\right)}{xy\left(\frac{2}{y}\right) + xy\left(\frac{1}{x}\right)} = \frac{y+x}{2x+y}$$

Won't Reduce

TRY:

$$\frac{\frac{3}{x}}{1 - \frac{1}{2y}} = \frac{6y}{2xy - x} = \frac{6y}{x(2y-1)}$$

$$\text{Try: } \frac{\frac{x-2}{3} - \frac{2}{x+1}}{\frac{x-1}{x-1} + \frac{1}{x+1}} = \frac{(x-2)(x+1) - 2(x-1)}{3(x+1) + x-1}$$

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

$$\text{Try: } \frac{\frac{2j+4}{j+8} - \frac{j-1}{j-2}}{j^2 + 6j - 16} = \frac{(j+8)(j-2)}{j^2 + 6j - 16} = \frac{j(x-3)}{2(2x+1)}$$

$$\frac{(2j+4)(j-2) - (j-1)(j+8)}{j^2 - 49}$$

$$= \frac{2j^2 - 8 - (j^2 + 7j - 8)}{j^2 - 49} = \frac{j^2 - 7j}{j^2 - 49}$$

$$= \frac{j(j-7)}{(j-7)(j+7)} = \frac{j}{j+7}$$

COMPLEX FRACTIONS - Worksheet 1

Complex Fraction: A fraction that contains a fraction in its numerator or denominator. To simplify write the numerator as a single fraction, write the denominator as a single fraction, then multiply by the reciprocal of the denominator.

1. $\frac{2 + \frac{3}{5}}{5 + \frac{1}{4}}$

2. $\frac{3ab}{\frac{x}{6a^2b} + x^2}$

3. $\frac{x + \frac{x}{y}}{1 + \frac{1}{y}}$

4. $\frac{1 + \frac{1}{2z}}{z - \frac{1}{4z}}$

5. $\frac{z+1 - \frac{20}{z}}{z-2 - \frac{z}{z}}$

6. $\frac{1 + \frac{1}{a} + \frac{2}{a^2}}{2 + \frac{1}{a} + \frac{2}{a^2}}$

7. $\frac{1 + \frac{2}{9}}{2 - \frac{1}{3}}$

8. $\frac{1 + \frac{1}{a^2}}{1 - \frac{1}{a^2}}$

9. $\frac{2 + \frac{1}{x} - \frac{1}{x^2}}{1 + \frac{4}{x} + \frac{3}{x^2}}$

- Answers:
1. $\frac{52}{105}$
 2. $\frac{x}{2a}$
 3. x
 4. $\frac{2}{2z-1}$
 5. $\frac{z+5}{z+2}$
 6. $\frac{a^2+a+2}{2a^2+5a+2}$

7. $\frac{11}{15}$

8. $\frac{a^2+1}{a^2-1}$

9. $\frac{2x-1}{x+3}$