How would you simplify this without using a calculator?

$$\frac{3+\frac{4}{3}}{\frac{11}{6}-1}$$

Simplify:

$$\frac{3 + \frac{4}{3}}{\frac{11}{6} - 1}$$

There are many methods to do this, I'll focus on two methods.

Complex Fractions: (also known as Compound Fractions)
Fractions whose numerators and/or
denominators also have fractions.

$$\frac{3 + \frac{4}{3}}{\frac{11}{6} - 1}$$

One method:

- 1. Find LCM of all the denominators in the complex fraction.
- 2. Then multiply the numerator and denominator of the complex fraction by this LCM.

This is called "clearing the denominators".

3. Simplify what remains.

$$\frac{\left(3+\frac{4}{3}\right)}{6\left(\frac{11}{6}-1\right)}$$

$$\frac{18+8}{11-6} = \frac{26}{5}$$

$$\frac{3+\frac{4}{3}}{\frac{11}{6}-1}$$

- 1. Get ALL the "parts" of the complex fraction to have the LCD.
- 2. Then you can cancel all of the denominators.
- 3. Simplify what remains.

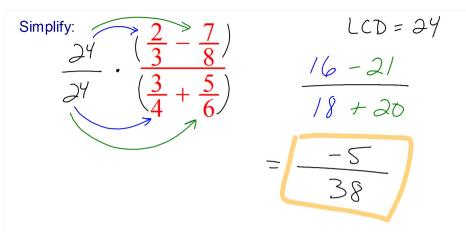
$$\frac{\frac{6}{6}}{\frac{3}{1} + \frac{4}{3}} \cdot \frac{2}{2} = \frac{\frac{18}{6} + \frac{8}{6}}{\frac{11}{6} - \frac{1}{1}} \cdot \frac{6}{6} = \frac{\frac{18+8}{6}}{\frac{11-6}{5}} = \frac{\frac{18+8}{6}}{\frac{11-6}{5}}$$

Simplify:
$$\frac{c^5 d^4}{c^5 d^2} \cdot \frac{3}{c^5 d^2} + \frac{11}{c d^3}$$

$$\frac{4}{c^3 d^4} - \frac{5}{c^2}$$

$$LCD = c^{5}d^{4}$$

$$\frac{3d^{2} + 1/c^{4}d}{4c^{2} - 5c^{3}d^{4}}$$



Simplify:
$$\frac{3^{4}x^{5}y^{4}}{3^{4}x^{5}y^{4}} \cdot \frac{\frac{9}{8x^{3}y} - \frac{5}{12xy}}{\left(\frac{3}{4x^{2}y^{4}} - \frac{7}{6x^{5}}\right)}$$

$$LCD = 24x^{5}y^{9}$$

$$\frac{27x^{2}y^{3} - 10x^{9}y^{3}}{18x^{3} - 28y^{9}}$$

Simplify:

$$\frac{x-5}{x-5} \cdot \frac{6+\frac{2}{x-5}}{(\frac{1}{x-5}-8)} = \frac{6(x-5)+2}{/-8(x-5)}$$

$$= \frac{6x-30+2}{/-8x+40}$$

$$= \frac{6x-28}{-8x+4}$$

Simplify:
$$\frac{4x}{x^{2} + 8x + 7} = (x+7)(x+1)$$

$$\frac{5x}{x^{2} + 6x - 7} + \frac{6}{x^{2} - 1} = (x+1)(x-1)$$

$$\frac{(x+7)(x+1)(x-1)}{(x+7)(x+1)(x-1)} \cdot \frac{\frac{4x}{(x+7)(x+1)}}{\frac{5x}{(x+7)(x-1)} + \frac{6}{(x+1)(x-1)}} = \frac{4x}{(x+7)(x-1)}$$

$$= \frac{4x}{x^{2} + 8x + 7} = (x+7)(x+1)$$

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$$\frac{4x}{(x+7)(x-1)} = \frac{4x}{(x+7)(x-1)}$$

$$= \frac{4x}{(x+7)(x-1)}$$

Simplify:
$$\frac{\frac{3}{x+2}}{\frac{1}{x+5} + \frac{10x}{x^2 + 7x + 10}} \rightarrow (x+5)(x+2)$$

$$\frac{(x+2)(x+5)}{(x+2)(x+5)} = \frac{\frac{3}{x+2}}{\frac{1}{x+5} + \frac{10x}{(x+5)(x+2)}} = \frac{3(x+5)}{|(x+2) + 10x|}$$

$$= \frac{3(x+5)}{|(x+2) + 10x|}$$

Hwk #37

Due tomorrow

Practice Sheet - Complex Rational Expressions