Complex fractions, or, "fractions within fractions"

$$\frac{\frac{a}{b}+\frac{c}{d}}{\frac{e}{f}+\frac{g}{h}}$$

simplify with common denominator

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$$\frac{\frac{i}{j}}{\frac{k}{l}} \qquad \frac{i \cdot l}{j \cdot k}$$

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

$x \neq 0$, $y \neq 0$

LCM: xy

$$\frac{\frac{1}{x}\cdot\frac{y}{y}+\frac{x}{y}\cdot\frac{x}{x}}{\frac{1}{y}+\frac{y}{y}}$$

$$\frac{\frac{y}{xy}+\frac{x^2}{xy}}{\frac{y+1}{y}} = \frac{\frac{(y+x^2)}{xy}}{\frac{(y+1)}{y}} = \frac{y+x^2}{xy}\cdot\frac{y}{y+1} = \frac{y+x^2}{x(y+1)}$$

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$y \neq 0$

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

$$\frac{1}{\frac{1\cdot y}{1\cdot y}+\frac{x}{y}} = \frac{1}{\frac{y}{y}+\frac{x}{y}} = \frac{1}{\frac{x+y}{y}} = \frac{y}{x+y}$$