

6.3 Complex fractions

$$\frac{\frac{a}{b}}{\frac{c}{d}} = \frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$$

$$\frac{\frac{2}{3}}{\frac{3}{4}} = \frac{2}{3} \div \frac{3}{4} = \frac{2}{3} \cdot \frac{4}{3} = \frac{8}{9}$$

#18
$$\frac{\frac{3}{x-4} - \frac{2}{4-x}}{\frac{2}{x(x-4)}} = \frac{\frac{3}{x-4} + \frac{2}{x-4}}{\frac{2}{x(x-4)}} = \frac{\frac{5}{x-4}}{\frac{2}{x(x-4)}} = \frac{5}{2} \cdot \frac{x(x-4)}{x(x-4)} = \frac{5x}{2}$$

method #1 single fraction i.e. the numerator / denominator

$$\frac{5}{x-4} \cdot \frac{x(x-4)}{2} = \frac{5x}{2}$$

Method #2 - Lcd for everything, multiply everything by the LCD

#1
$$\frac{\frac{2}{3} + \frac{3}{4}}{\frac{1}{6}} = \frac{\frac{8}{12} + \frac{9}{12}}{\frac{1}{6}} = \frac{17}{12} \cdot \frac{6}{6} = \frac{17}{2}$$

$$\frac{\frac{1}{6} + \frac{3}{2}}{\frac{1}{6}} = \frac{\frac{1}{6} + \frac{9}{2}}{\frac{1}{6}} = \frac{10}{6}$$

#2
$$\frac{\frac{2}{3} + \frac{3}{4}}{\frac{1}{6} + \frac{3}{2}} = \frac{\frac{4}{12} \cdot 2 + \frac{3}{4} \cdot 3}{\frac{1}{6} + \frac{6}{2}} = \frac{8+9}{2+18} = \frac{17}{20}$$

$$\begin{array}{l} \text{LCD} \\ 12 \end{array} \quad \frac{\frac{1}{3} + \frac{3}{4}}{\frac{2}{3} - \frac{1}{2}} = \frac{4+9}{8-6} = \frac{13}{2}$$

$$\begin{array}{l} \text{LCD } (x) \\ (x) \end{array} \quad \frac{\frac{3}{x-4} - \frac{2}{4-x}}{\frac{2}{x-4} - \frac{2}{x}} = \frac{\frac{3}{x-4} + \frac{2}{x-4}}{\frac{2}{x-4} - \frac{2}{x}} = \frac{3(x)+2(x)}{2(x)-2(x-4)} = \frac{5x}{-2x+8}$$

$$\begin{array}{l} \text{LCD} \\ (x+2)(x-2) \end{array} \quad \frac{\frac{2}{x^2-4} + \frac{3}{x+2}}{\frac{5}{x-2} + \frac{4}{x+2}} = \frac{2+3(x-2)}{5(x+2)+4(x-2)} = \frac{2+3x-6}{5x+10+4x-8}$$

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

$$2x^{-1} = \frac{2}{x}$$