

$$\frac{\frac{18a^3}{b^2}}{\frac{6a^2}{b}} = \frac{18a^3}{b^2} \div \frac{6a^2}{b}$$

$$= \frac{18a^3}{b^2} \cdot \frac{b}{6a^2} \quad \text{KCF}$$

$$= \frac{\cancel{3} \cancel{18} a^3 b}{\cancel{6} a^2 b^2} = 3a^{3-2} b^{1-2}$$

$$= 3ab^{-1}$$

$$= \frac{3a}{b}$$

$$\frac{\frac{1}{4x} - \frac{3}{2}}{3 - \frac{1}{2x}} = \left(\frac{1}{4x} - \frac{3}{2} \right) \div \left(3 - \frac{1}{2x} \right)$$

LCD: 4x
numerator

LCD: 2x
Denominator

Brute Force

1. Rewrite as division

2. +/- both divisor & dividend separately.

3. KCF

4. Simplify

$$= \left(\frac{\cancel{4x}}{\cancel{4x}} \cdot \frac{1}{\cancel{4x}} - \frac{\cancel{4x}}{\cancel{4x}} \cdot \frac{3}{\cancel{2}} \right) \div \left(\frac{2x}{2x} \cdot 3 - \frac{2x}{2x} \cdot \frac{1}{2x} \right)$$

$$= \frac{1-6x}{4x} \div \frac{6x-1}{2x}$$

$$= \frac{\cancel{1-6x}}{\cancel{2} \cancel{4x}} \cdot \frac{2x}{\cancel{6x-1}}$$

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

$$\frac{\frac{1}{4x} - \frac{3}{2}}{3 - \frac{1}{2x}}$$

experiment:

LCD of all fractions: 4x

4x, 2, 1, 2x

$$\frac{4x}{4x} \cdot \frac{\left(\frac{1}{4x} - \frac{3}{2}\right)}{\left(3 - \frac{1}{2x}\right)}$$

$$\frac{4x}{1} \cdot \frac{1}{4x} = 1$$

$$\frac{4x}{1} \cdot -\frac{3}{2} = -\frac{12x}{2} = -6x$$

$$4x \cdot \left(-\frac{1}{2x}\right) = -\frac{4x}{2x} = -2$$

$$\frac{1 - 6x}{12x - 2}$$

$$\frac{-1 \cancel{(1 - 6x)}}{2 \cancel{(6x - 1)} |}$$

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

*Method 2

1. LCD of ALL fractions
2. Multiply numerator & denominator by LCD
3. Simplify

$$\frac{4 - \frac{6}{x}}{\frac{2}{x} - \frac{3}{x^2}} = \frac{x^2 \left(4 - \frac{6}{x}\right)}{x^2 \left(\frac{2}{x} - \frac{3}{x^2}\right)}$$

LCD: x^2

$$= \frac{4x^2 - 6x}{2x - 3} = \frac{2x(2x - 3)}{(2x - 3)} = 2x$$

$$\frac{\frac{1}{w+3} - \frac{1}{w-3}}{1 + \frac{9}{w^2-9}} = \frac{(w+3)(w-3)}{(w+3)(w-3)} \left(\frac{\frac{1}{w+3} - \frac{1}{w-3}}{1 + \frac{9}{w^2-9}} \right)$$

LCD: $(w+3)(w-3)$

$$= \frac{\frac{(w+3)(w-3)}{(w+3)} - \frac{(w+3)(w-3)}{(w-3)}}{(w+3)(w-3) + \frac{9(w+3)(w-3)}{(w+3)(w-3)}}$$

$$= \frac{(w-3) - (w+3)}{(w+3)(w-3) + 9}$$

$$= \frac{w-3 - w-3}{w^2 - 9 + 9}$$

$$= \frac{-6}{w^2}$$

$$= -\frac{6}{w^2}$$

$$\frac{\frac{5q}{p} - q}{q - \frac{2q}{p}}$$

LCD: p

$$\frac{p \left(\frac{5q}{p} - q \right)}{p \left(q - \frac{2q}{p} \right)}$$

$$= \frac{5q - pq}{pq - 2q}$$

$$= \frac{q(5-p)}{q(p-2)} = \frac{5-p}{p-2}$$

$$\frac{\frac{4}{h+3} - \frac{4}{3}}{h}$$

LCD: 3(h+3)

$$\frac{3(h+3) \left(\frac{4}{h+3} - \frac{4}{3} \right)}{3(h+3) \cdot h}$$

$$= \frac{3\cancel{(h+3)} \cdot \frac{4}{\cancel{h+3}} - \cancel{3(h+3)} \cdot \frac{4}{3}}{3h(h+3)}$$

$$= \frac{12 - (4h+12)}{3h(h+3)}$$

$$= \frac{\cancel{12} - 4h - \cancel{12}}{3h(h+3)}$$

$$= \frac{\cancel{-4h}}{\cancel{3h}(h+3)}$$

$$= \frac{-4}{3(h+3)}$$

$$= -\frac{4}{3(h+3)}$$