C12 - 6.0 - Fractions/LCD/Exponents/Distribution Theory

Multiply

$$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd} \qquad a \times \frac{b}{c} = \frac{ab}{c} \qquad \frac{a}{b} \times c = \frac{ac}{b} \qquad \frac{1}{a} \times a = 1$$

Divide

$$\frac{\left(\frac{a}{b}\right)}{\left(\frac{c}{d}\right)} =$$

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

$$\frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc} \qquad \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$$

$$\frac{a}{\left(\frac{b}{c}\right)} =$$

$$a \div \frac{b}{c} = \qquad a \div \frac{b}{c} =$$

$$a \times \frac{c}{b} = \frac{ac}{b} \qquad a \times \frac{c}{b} = \frac{ac}{b}$$

$$\frac{\left(\frac{a}{b}\right)}{c} =$$

$$\frac{a}{b} \div c = \qquad \frac{a}{b} \div c =$$

$$\frac{a}{b} \times \frac{1}{c} = \frac{a}{bc} \qquad \frac{a}{b} \times \frac{1}{c} = \frac{a}{bc}$$

Add/Subtract

$$\boxed{\frac{a}{b} + \frac{c}{b} = \frac{a+c}{b}} \quad \frac{a}{b} + \frac{c}{d} = \frac{ad+cb}{bd} \quad \frac{a}{b} + \frac{c}{bd} = \frac{ad+c}{bd} \quad \frac{a}{b^2} + \frac{c}{b} = \frac{a+cb}{b^2} \quad \frac{a}{b} + \frac{c}{b+1} = \frac{a(b+1)+cb}{b(b+1)}$$

$$\frac{a+b}{c} = \frac{a}{c} + \frac{b}{c} \quad \text{Separate} \quad \frac{a}{b+c} \neq \frac{a}{b} + \frac{a}{c} \quad \text{Common Mistakes} \quad \frac{\cancel{x+a}}{x} \neq 1+a \quad \frac{x+a}{x} = \frac{x}{x} + \frac{a}{x}$$

$$\boxed{a+b+c = a+c+b} \quad \text{Rearrange} \quad \boxed{ab = ba} \quad \text{Mirror} \quad Reciprocal: \frac{a}{b} \to \frac{b}{a}$$

$$\boxed{\begin{array}{c}\frac{a}{b} = \frac{c}{d} \\ da = cb\end{array}} \quad \boxed{\begin{array}{c}\text{Cross} \\ \text{Multiply}\end{array}} \quad \frac{a}{b} = \frac{c}{d} \quad \boxed{a = \frac{cb}{d} \qquad \frac{da}{b} = c \qquad \frac{da}{c} = b \qquad d = \frac{cb}{a}}$$

$$\boxed{\begin{array}{c}\frac{x}{2} = \frac{1}{2} \\ \frac{\frac{x}{2}}{2} = \frac{\frac{1}{2}}{2} \\ x = 1\end{array}} \quad \boxed{\frac{x}{4} = \frac{1}{4} + \frac{2}{4}} \quad \begin{array}{l}\text{Multiply} \\ \text{Both Sides} \\ \text{By LCD}\end{array} \qquad \boxed{\frac{\frac{1}{x}+1}{2+\frac{3}{x}} = \frac{1+x}{2x+3}} \quad \begin{array}{l}\text{Multiply} \\ \text{Top/Bottom} \\ \text{By LCD}\end{array}$$

$$x \times x = x^2 \qquad x \times x^2 = x^3 \qquad \boxed{x^m \times x^n = x^{m+n}} \qquad \frac{x^2}{x} = x \quad \frac{x^3}{x^2} = x \quad \frac{x^3}{x} = x^2 \quad \frac{x}{x} = 1 \quad \boxed{\frac{x^m}{x^n} = x^{m-n}}$$

$$\boxed{(x^m)^n = x^{m \times n}} \quad \boxed{x^{-a} = \frac{1}{x^a} \qquad \frac{1}{x^a} = x^{-a} \qquad \frac{2^{-3}-1}{x} = \frac{\frac{1}{2^3}-1}{x} \neq \frac{-1}{2^{-3}x} \quad \begin{array}{l}\text{Common} \\ \text{Mistakes}\end{array}} \quad \boxed{x^{\frac{m}{n}} = \sqrt[n]{x^m}}$$

$$x(x+1) \qquad (x-2)(x+1) \qquad (2x+1)(x+1) \qquad (x+1)(x-1)$$
$$x^2 + x \qquad \quad x^2 - x - 2 \qquad \quad 2x^2 + 3x + 1 \qquad \quad x^2 - 1$$

FOIL Conjugates: FL

$$x^2 + x \qquad x^2 - x - 2 \qquad 2x^2 + 3x + 1 \qquad x^2 - 1$$
$$x(x+1) \qquad (x-2)(x+1) \qquad (2x+1)(x+1) \qquad (x+1)(x-1)$$