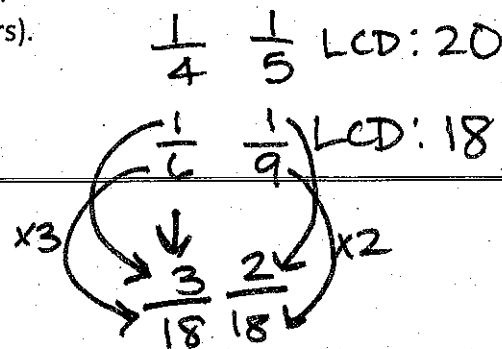


Notes – Multi-Step Equations with Fractions/Decimals and Algebraic Proportions

Equations with Fractions/Decimals:

Steps:

1. Clear parentheses by using the distributive property.
2. If there are fractions or decimals, clear them by multiplying by the lowest common denominator (lowest decimal place value for decimal numbers).
3. Combine like terms on each side of the equal sign.
4. Add or subtract to isolate the variable
5. Multiply or Divide to isolate the variable



Example 1: $\frac{2}{7}x + \frac{4}{7}x = -\frac{30}{7}$

Multiply by 7 to clear the fraction. $2x + 4x = -30$. Solve like other equations.

$$\begin{aligned} 6x &= -30 \\ \boxed{x} &= -5 \end{aligned}$$

Example 2: $28 - 2.2y = 11.6y + 262.6$

Multiply by 10 (since lowest decimal is tenths place). $280 - 22y = 116y + 2626$. Solve.

$$\begin{aligned} -280 & \quad -280 \\ -22y &= 116y + 2,346 \\ -116y & \quad -116y \\ -138y &= 2,346 \\ -138 & \quad -138 \\ \boxed{y} &= -17 \end{aligned}$$

Try on your own and check with a partner

1. $-\frac{17}{24} = -\frac{4}{3}x - \frac{7}{4} + \frac{1}{2}x$

$$\frac{-17}{24} = -\frac{32x-42}{24} + \frac{12}{24}x$$

$$\frac{-17}{24} = -\frac{20}{24}x - \frac{42}{24}$$

$$\frac{25}{24} = x - \frac{4}{3} - 1 + \frac{42}{24}$$

$$\frac{25}{24} = -\frac{20x}{24}$$

$$\begin{aligned} 25 &= -20x \\ \boxed{x} &= -\frac{5}{4} \end{aligned}$$

2. $13.7b - 6.5 = -2.3b + 8.3$

4. $27.67x - 8 = 22.56x + 40$

Name:

Date:

Period:

Algebraic Proportions:

Steps:

1. Cross multiply
2. Distribute
3. Combine like terms
4. Add or subtract to isolate the variable
5. Multiply or divide to isolate the variable

Example 1: $\frac{x+4}{5} = \frac{x-2}{7}$ $7(x+4) = 5(x-2)$ Solve like other equations.

Example 2: $\frac{x+2}{14} = \frac{x}{5}$ $5(x+2) = 14(x)$ Solve.

Example 3: $\frac{12x-32}{4x} = 5$ Rewrite as $\frac{12x-32}{4x} = \frac{5}{1}$ $5(4x) = 1(12x-32)$ Solve.

Try on your own and check with a partner.

1. $\frac{2x-2}{3x+6} = \frac{2}{5}$

$(2x-2)(5) = (3x+6)(2)$

$10x - 10 = 6x + 12$
 $+10 \qquad +10$

$10x = 6x + 22$
 $-6x \qquad -6x$

3. $0.07x + 9.95 = 12.47 - .05x$

$4x = 22$
 $\frac{4x}{4} = \frac{22}{4}$
 $x = \frac{22}{4}$

2. $\frac{5}{r-9} = \frac{8}{r+5}$

$5(r+5) = 8(r-9)$

$5r + 25 = 8r - 72$
 $-25 \qquad -25$

$5r = 8r - 97$
 $-8r \qquad -8r$

4. $4x + 2.5 = -28.4 - 2.2x$

$-3r = -97$
 $\frac{-3r}{-3} = \frac{-97}{-3}$
 $r = \frac{97}{3}$