

Math 9
Ch. 6 - Linear Equations and Inequalities

Name: _____
Block: _____

6.2 Part 2 - Solving Equations Containing Fractions

num.
denom.

To solve an equation containing a fraction, the variable must be in the numerator.
If it is in the denominator, we can create an equivalent equation and solve it instead. Remember that whatever you do to one side of the equation, you must do to the other.

Ex. 1: Solve.

$$(a) \quad \cancel{x} \left(\frac{96}{\cancel{x}} \right) = (4)^{\cancel{x}}$$

$$\frac{96}{4} = \frac{4x}{4}$$

$$\boxed{24 = x}$$

$$(b) \quad \cancel{r} \left(\frac{122}{\cancel{r}} \right) = (4)^{\cancel{r}}$$

$$\frac{122}{4} = \frac{4r}{4}$$

$$\boxed{30.5 = r}$$

If an equation contains fractions, but the variable is not in the denominator, we can still eliminate the fractions by multiplying every term by the common denominator (C.D.)

Ex. 2: Solve.

→ C.D. of 3 and 5 = 15

$$(a) \quad \frac{2a}{3} = \frac{4a}{5} + 7$$

$$\overset{5}{\cancel{15}} \left(\frac{2a}{\cancel{3}} \right) = \overset{3}{\cancel{15}} \left(\frac{4a}{\cancel{5}} \right) + 15(7)$$

$$10a = +12a + 105$$

$$\begin{array}{r} -12a \\ \hline -2a = 105 \\ \hline -2 \quad -2 \\ \hline a = -52.5 \end{array}$$

$$\boxed{a = -52.5}$$

$$\frac{2}{3} \times \frac{4}{7} = \frac{8}{21}$$

$$(b) \frac{3}{2} \left(\frac{3x}{1} + \frac{1}{1} \right) = \frac{3x}{4}$$

C.D. for 2 and 4: 4

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

$$24 \left(\frac{9x}{2} \right) + 24 \left(\frac{3}{2} \right) = 4 \left(\frac{3x}{4} \right)$$

$$18x + 6 = 3x$$

$$-3x$$

$$15x + 6 = 0$$

$$-6$$

$$\frac{15x}{15} = \frac{-6}{15}$$

$$x = -0.4$$

$$\text{OR } x = -\frac{2}{5} \checkmark$$

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If it is in the denominator, we can create an equivalent equation and solve it instead. Remember that whatever you do to one side of the equation, you must do to the other.

Ex. 1: Solve.

(a) $\frac{96}{x} = 4$

(b) $\frac{122}{r} = 4$

If an equation contains fractions, but the variable is not in the denominator, we can still eliminate the fractions by multiplying every term by the _____.

Ex. 2: Solve.

(a) $\frac{2a}{3} = \frac{4a}{5} + 7$

$$(b) \frac{3}{2}(3x + 1) = \frac{3x}{4}$$