

Unit 8 Solving Equations & Inequalities

8.2 Two-Step Equations

When solving two-step equations with fractions we can use either:

A) Regular equation solving steps

Ex. Solve:

$$2x + \frac{1}{10} = \frac{3}{5} \cdot 2$$

Method A

+ need LCD
10 + 5 = 10

$$2x = \frac{6}{10} - \frac{1}{10} = \frac{5}{10}$$

$$\frac{2x}{2} = \frac{1/2}{2/1}$$

$$x = \frac{1}{2} \times \frac{1}{2}$$

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

$$\frac{k}{3} - \frac{1}{2} = -1\frac{3}{4} - \frac{7}{4}$$

+ 1/2

$$\frac{k}{3} = -\frac{7}{4} + \frac{1}{2}$$

$$3\left(\frac{k}{3}\right) = (-5/4) \cdot \frac{3}{1}$$

$$k = -15/4$$

$$2y + \frac{1}{2} = \frac{3}{4}$$

$$\frac{n}{2} - \frac{3}{4} = 2\frac{3}{8}$$

B) Denominator elimination

* multiply all terms by the LCD

Method B

$$10(2x) + 10\left(\frac{1}{10}\right) = 10\left(\frac{3}{5}\right)$$

$$LCD = 10$$

$$20x + 1 = 6$$

$$20x = 5$$

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

$$\frac{4}{12}\left(\frac{k}{3}\right) - \frac{1}{12}\left(\frac{1}{2}\right) = \frac{3}{12}\left(-\frac{7}{4}\right)$$

$$LCD = 12$$

$$4k - 1 = -21$$

$$4k = -20$$

$$k = -5$$

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

$$8y + 2 = 3$$

$$8y = 1$$

$$y = \frac{1}{8}$$

$$\frac{4}{8}\left(\frac{n}{2}\right) - \frac{3}{8}\left(\frac{3}{4}\right) = \frac{8}{8}\left(2\frac{3}{8}\right)$$

$$4n - 9 = 19$$

$$4n = 28$$

$$n = 7$$

Equations with decimals just use regular equation solving process and a calculator for assistance.

Ex. Solve:

$$\frac{a}{2.8} - 2.5 = -3.7$$

$$+2.5 \quad +2.5$$

$$2.8 \left(\frac{a}{2.8} \right) = (-1.2) 2.8$$

$$a = -3.36$$

Ex. A long-distance plan costs \$4.95 a month plus 5 cents per minute. If the bill for one month was \$18.75, how many minutes of long distance calls were made? Solve using a linear equation.

Let $m = \# \text{ of minutes}$

flat rate + cost minutes = total

$$\begin{array}{rcl} 4.95 & + & 0.05m = 18.75 \\ -4.95 & & -4.95 \end{array}$$

$$\begin{array}{rcl} 0.05m & = & 13.80 \\ \hline 0.05 & & 0.05 \end{array}$$

$$m = 276 \text{ minutes}$$