

B: Solving Equations: $ax + b = c$, $\frac{x}{a} + b = c$

1. Multiply by LCD to "get rid" of fractions.
2. Isolate for the variable by adding or subtracting.
3. Solve for variable by dividing.

Examples:

1. Solve:

a) $8x - \frac{4}{5} = \frac{6}{5}$ Multiply by LCD (5).

$(8x)(5) - \frac{4}{5}(5) = \frac{6}{5}(5)$ The multiple 5 will cancel the denominator (5).

$40x - \frac{4(5)}{5} = \frac{6(5)}{5}$

$40x - 4 = 6$

Isolate x by "getting rid" of 4.

$40x - \cancel{4} = 6$
 $\quad \quad \quad +4 \quad \quad +4$

$\frac{40x}{40} = \frac{10}{40}$

Solve for x by dividing.

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

* This is $\frac{10}{40}$ in lowest reduced form.

$$2) \frac{x}{2} + 2\frac{2}{3} = \frac{2}{6}$$

Change mixed to improper.

$$\frac{x}{2} + \frac{8}{3} = \frac{2}{6}$$

Multiply by LCD (6).

$$\frac{x(6)}{2} + \frac{8(6)}{3} = \frac{2(6)}{6} \quad \text{Divide the LCD (6) by the denominator.}$$

$$6 \div 2 \quad 6 \div 3 \quad 6 \div 6 \text{ (cancels)}$$
$$x(3) + 8(2) = 2$$

$$3x + 16 = 2$$

Isolate 3x.

$$3x + 16 = 2$$
$$-16 \quad -16$$

$$3x = -14$$

Divide to solve for x.

$$\frac{3x}{3} = \frac{-14}{3}$$

$$\boxed{x = -\frac{14}{3}}$$

$$3) 2\frac{1}{2} = 8x + \frac{4}{3}$$

Change mixed to improper.

$$\frac{5}{2} = 8x + \frac{4}{3}$$

Multiply by LCD (6).

$$\frac{5(6)}{2} = 8x(6) + \frac{4(6)}{3} \quad \text{Divide LCD (6) by denominator.}$$

$$6 \div 2 \quad 6 \div 3$$

$$5(3) = 48x + 4(2)$$

$$15 = 48x + 8$$

Isolate 48x

$$15 = 48x + 8$$
$$-8 \quad -8$$

$$\frac{7}{48} = \frac{48x}{48}$$

$$\boxed{\frac{7}{48} = x}$$

$$d) \frac{6}{4} - \frac{2x}{3} = \frac{6}{8}$$

Multiply by LCD: 24

$$\frac{6}{4}(24) - \frac{2x}{3}(24) = \frac{6}{8}(24), \quad \text{Divide LCD (24) by denominators.}$$

$$24 \div 4 \quad 24 \div 3 \quad 24 \div 8$$

$$6(6) - 2x(8) = 6(3)$$

$$36 - 16x = 18$$

Isolate for x.

$$\begin{array}{r} 36 - 16x = 18 \\ -36 \quad -36 \end{array}$$

$$\frac{+16x}{-16} = \frac{+18}{-16}$$

Divide to solve for x.

$$\boxed{x = \frac{9}{8}}$$

2. Solve ; check.

$$a. \frac{x}{1.2} + 5 = -2 \quad \text{Multiply by LCD (1.2)}$$

$$\frac{x}{1.2}(1.2) + 5(1.2) = -2(1.2)$$

$$\frac{x}{1.2}(1.2) + 6 = -2.4$$

$$x + 6 = -2.4 \quad \text{Isolate for x.}$$

$$\begin{array}{r} x + 6 = -2.4 \\ -6 \quad -6 \end{array}$$

$$\boxed{x = -8.4}$$

Check:

$$\frac{x}{1.2} + 5 = -2 \quad \text{Substitute } -8.4 \text{ in for } x.$$

$$\frac{-8.4}{1.2} + 5 = -2$$

$$\begin{array}{r} -7 + 5 = -2 \\ -2 = -2 \end{array}$$

$$\boxed{x = -8.4 \text{ is true.}}$$

Quiz -

$$b) 4 + 25x = 1.1$$

Isolate for x .

$$4 + 25x = 1.1$$

$$\begin{array}{r} 4 + 25x = 1.1 \\ -4 \\ \hline \end{array}$$

$$\frac{25x}{25} = \frac{-2.9}{25}$$

Divide to solve for x .

$$x = -0.116$$

Check:

$$4 + 25x = 1.1$$

Substitute -0.116 in for x

$$4 + 25(-0.116) = 1.1$$

$$4 - 2.9 = 1.1$$

$$1.1 = 1.1$$

$x = -0.116$ is true

Assignment Pg. 311 # 7-12, Pg. 303 # 26-28