

D: Solving Equations: $ax = b + cx$, $ax + b = cx + d$, $a(bx + c) = d(ex + f)$

$ax = b + cx$ * Combine "x's" 1st *

$x + b = cx + d$ * combine "x's" 1st ; constants (b, d)

$a(bx + c) = d(ex + f)$ * multiply in 1st.

Examples:

1. Solve.

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

$3\left(\frac{x}{4}\right) = 4\left(\frac{2}{3}\right) + 4\left(\frac{x}{3}\right)$ LCD = 12

$3x = 8 + 4x$
 $-4x$

$x = -8$

b) $30.6x + 8.6 = 33.8 - 32.4x$

$+32.4x$

$63x + 8.6 = 33.8$
 -8.6

$63x = 25.2$
 63

$x = 0.4$

c) $0.4(8y + 6) = 1.2(8y - 1)$

$3.2y + 2.4 = 9.6y - 1.2$
 $-9.6y$

$-6.4y + 2.4 = -1.2$
 -2.4

$-6.4y = -3.6$
 -6.4

$y = 0.5625$

$$d) \frac{12m-6}{5} \neq \frac{8m-2}{3}$$

$$(12m-6) \times 3 = (5)(8m-2)$$

$$\begin{array}{r} 36m - 18 = 40m - 10 \\ -40m \quad -40m \\ \hline -4m - 18 = -10 \\ +18 \quad +18 \\ \hline -4m = 8 \\ \hline -4 \quad -4 \\ \hline m = -2 \end{array}$$

$$m = -2$$

2. Solve and check.

$$a) \cancel{12x} | x = 3.2 + 0.5x$$

$$\begin{array}{r} -0.5x \quad -0.5x \\ \hline 0.5x = 3.2 \\ \hline 0.5 \quad 0.5 \\ \hline x = 6.4 \end{array}$$

check: $6.4 = 3.2 + 0.5(6.4)$

$$6.4 = 3.2 + 3.2$$

$$6.4 = 6.4$$

$$x = 6.4 \text{ is true}$$

$$b) \left(\frac{1}{12}x\right)^{12} - (10)^{12} = \left(\frac{1}{4}x\right)^{12} + (4)^{12} \quad LCD=12$$

$$\begin{array}{r} 1x - 120 = 3x + 48 \\ -3x \quad -3x \\ \hline -2x - 120 = 48 \\ +120 \quad +120 \\ \hline -2x = 168 \\ \hline -2 \quad -2 \\ \hline x = -84 \end{array}$$

check:

$$\frac{1}{12}(-84) - 10 = \frac{1}{4}(-84) + 4$$

$$-7 - 10 = -21 + 4$$

$$-17 = -17$$

$$x = -17 \text{ is true}$$

c)

$$4(x - 0.2) = 6(0.6 - x)$$

$$\begin{array}{r} 4x - 0.8 = 3.6 - 6x \\ +6x \qquad \qquad +6x \end{array}$$

$$\begin{array}{r} 10x - 0.8 = 3.6 \\ +0.8 \quad +0.8 \end{array}$$

$$\frac{10x}{10} = \frac{4.4}{10}$$

$$\boxed{x = 0.44}$$

check:

$$4(0.44 - 0.2) = 6(0.6 - 0.44)$$

$$4(0.24) = 6(0.16)$$

$$0.96 = 0.96$$

$x = 0.44$ is true.

Assignment Pg. 327 # 6-12

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