Homework Qs

Note Title 1/26/2016

1.6 # 21 $0.08x + 0.09x$

$= \boxed{0.17x}$

$$\begin{array}{r} 0.08 \\ 0.09 \\ \hline 0.17 \end{array}$$

1.6 # 39 $(4x - 7) - (2x + 5)$

$= 4x - 7 - 1(2x + 5)$

$= 4x - 7 - 2x - 5$

$= \boxed{2x - 12}$

1.6 # 47 $-(2x + 1) - \frac{1}{2}(x + 5)$

$= -2x - 1 - \frac{1}{2}(x) - \frac{1}{2}(5)$

$= -2x - 1 - \frac{1}{2}x - \frac{5}{2}$ [or, equivalently, $-2x - 1 - \frac{x}{2} - \frac{5}{2}$]

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

$= -\frac{2x}{1}\left(\frac{2}{2}\right) - \frac{1}{2}x - \frac{1}{1}\left(\frac{2}{2}\right) - \frac{5}{2}$

$= -\frac{4}{2}x - \frac{1}{2}x - \frac{2}{2} - \frac{5}{2}$

$= \boxed{-\frac{5}{2}x - \frac{7}{2}}$

1.6 #73 Evaluate the expression for $x = -3$ and $y = 5$.

$$x^2 - 2xy + y^2$$

$$(-3)^2 - 2(-3)(5) + (5)^2$$

$$= 9 + 6(5) + 25$$

$$= 9 + 30 + 25$$

$$= 39 + 25$$

$$= \boxed{64}$$

Think of $\boxed{(-3)}^2 - 2\boxed{(-3)}\boxed{(5)} + \boxed{(5)}^2$

Recall:

$2(3)(5) = 6(5) = 30$

$2(3)(5) = 2(15) = 30$

$2(3)(5) = 10(3) = 30$

$2(3+5) = 2(3) + 2(5) = 6 + 10 = 16$

or $2(3+5) = 2(8) = 16$

Note:

$$-3^2 = -(3)(3) = \boxed{-9}$$

$$(-3)^2 = (-3)(-3) = \boxed{9}$$

2.1 #11 $x - 2 = 3x + 1$ Is $\frac{-3}{2}$ a solution to the equation?

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

$$-\frac{3}{2} - 2 = \frac{-9}{2} + 1$$

$$-\frac{3}{2} - \frac{2}{1}\left(\frac{2}{2}\right) = -\frac{9}{2} + \frac{1}{1}\left(\frac{2}{2}\right)$$

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

$$-\frac{7}{2} = -\frac{7}{2} \quad \text{True!}$$

Yes, $-\frac{3}{2}$ is a solution.

Note: $\frac{-3}{2} = -\frac{3}{2}$

$\frac{-9}{2} = -\frac{9}{2}$

all the same:

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

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

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

2.2 #17 $\frac{x}{3} = 2$

$\frac{1}{3}x = 2$ or $\frac{1x}{3} = 2$

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

$1x = \frac{6}{1}$

$x = 6$

what if I multiply by $\frac{3}{x}$?

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

$1 = \frac{6}{x}$ now multiply both sides by x.

$(x)1 = \frac{6}{x}(x)$

$x = \frac{6}{1}$

$x = 6$

Is the following solution correct?

2.2 #35) Solve.

$$18 - 13 = \frac{1}{2}a + \frac{3}{4}a - \frac{5}{8}a$$

$$5 = \left(\frac{4}{4}\right)\frac{1}{2}a + \frac{3}{4}a\left(\frac{2}{2}\right) - \frac{5}{8}a$$

$$5 = \frac{4}{8}a + \frac{6}{8}a - \frac{5}{8}a$$

$$5 = \frac{10}{8}a - \frac{5}{8}a$$

$$5 = \frac{5}{8}a$$

$$\left(\frac{8}{5}\right)5 = \frac{5}{8}a\left(\frac{8}{5}\right)$$

$$8 = a$$

$\{8\}$

2.2 #63) $x + \frac{1}{2} = \frac{1}{4}x - \frac{5}{8}$

$$x - \frac{1}{4}x = -\frac{5}{8} - \frac{1}{2}$$

$$\left(\frac{4}{4}\right)\frac{1}{1}x - \frac{1}{4}x = -\frac{5}{8} - \frac{1}{2}\left(\frac{4}{4}\right)$$

$$\frac{4}{4}x - \frac{1}{4}x = -\frac{5}{8} - \frac{4}{8}$$

$$\frac{3}{4}x = -\frac{9}{8}$$

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

$$x = -\frac{3}{2}$$

$\left\{-\frac{3}{2}\right\}$

2.3: Solving Linear Equations (Combining the Additive and multiplicative Properties)

Ex: Solve.

$$\frac{1}{4}x - \frac{2}{5}x + \frac{1}{3} - \frac{5}{2} = 6x - \frac{2}{3}$$

$$\frac{1}{4}x - \frac{2}{5}x - 6x = -\frac{2}{3} - \frac{1}{3} + \frac{5}{2}$$

$$\left(\frac{5}{5}\right)\left(\frac{1}{4}x\right) - \frac{2}{5}x\left(\frac{4}{4}\right) - \frac{6x}{1}\left(\frac{20}{20}\right) = -\frac{2}{3}\left(\frac{2}{2}\right) - \frac{1}{3}\left(\frac{2}{2}\right) + \frac{5}{2}\left(\frac{3}{3}\right)$$

$$\frac{5}{20}x - \frac{8}{20}x - \frac{120}{20}x = -\frac{4}{6} - \frac{2}{6} + \frac{15}{6}$$

$$-\frac{123}{20}x = \frac{9}{6}$$

$$-\frac{123}{20}x = \frac{3}{2}$$

$$\left(-\frac{20}{123}\right)\left(-\frac{123}{20}x\right) = \frac{3}{2}\left(-\frac{\cancel{20}^{10}}{123}\right)$$

$$x = -\frac{30}{123}$$ Reduce this.

Useful trick:
If the sum of a number's digits is divisible by 3 (or by 9), then the number is divisible by 3 (or by 9).

$$3\overline{)123}\quad 41,\ \frac{12}{3},\ \frac{3}{0}$$

So $-\frac{\cancel{30}^{10}}{\cancel{123}_{41}} = -\frac{10}{41}$

Solution Set: $\left\{-\frac{10}{41}\right\}$

Ex: Solve.

$$4(7x-2) = 2(14x-1)$$

$$28x - 8 = 28x - 2$$

$-28x$ $\quad$ $-28x$

$$0x - 8 = -2$$

$$-8 = -2 \quad \text{False}$$

$+8$ $\quad$ $+8$

$$0 = 6 \quad \text{False!}$$

So the original eqn must also be false for every x.

No Solution

The solution set is $\emptyset$, the empty set.

Ex: Solve.

$$-2(3-x) + 5x = 7x - 6$$

$$-6 + 2x + 5x = 7x - 6$$

$$-6 + 7x = 7x - 6$$

$$7x - 6 = 7x - 6 \leftarrow \text{True for every } x$$

$-7x$ $\quad$ $-7x$

$$-6 = -6 \leftarrow \text{True for every } x$$

$+6$ $\quad$ $+6$

$$0 = 0 \quad \text{True for every } x.$$

Solution Set

All real numbers (every x makes the eqn true)

In xyzhomework, enter No Solution as DNE. (does not exist)

enter All Real Numbers as oo. (lower-case o's)