Homework Q's

Note Title 8/31/2015

2.1 #69 $5x - \frac{2}{3} = 4x + \frac{4}{3}$

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

$x = \frac{6}{3}$

$x = 2$

Sol'n Set: $\{2\}$

2.2 #39 $\frac{1}{2}x + \frac{1}{3}x = \frac{1}{2} - 3$

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

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

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

$\left(\frac{6}{5}\right)\left(\frac{5}{6}x\right) = \left(-\frac{5}{2}\right)\left(\frac{6}{5}\right)$

$\frac{30}{30}x = -\frac{30}{10}$

$1x = -3$

Sol'n Set: $\{-3\}$

2.2 #53 $\frac{1}{8} + \frac{1}{2}x = \frac{1}{4}$

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

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

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

$\frac{1}{2}x = \frac{1}{8}$

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

$x = \frac{2}{8}$

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

$\left\{\frac{1}{4}\right\}$

Another way to do 2.2 # 53:

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

multiply both sides by 8:

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

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

$$1 + 4x = 2$$

$$4x = 1$$

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

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

$\left\{\frac{1}{4}\right\}$

Ex: Solve.

$$3 + \frac{2}{3}x = \frac{1}{4} - 9x$$

multiply both sides by 12:

$$12\left(3 + \frac{2}{3}x\right) = \left(\frac{1}{4} - 9x\right)(12)$$

$$12(3) + 12\left(\frac{2}{3}x\right) = \frac{1}{4}(12) - 9x(12)$$

$$36 + 8x = 3 - 108x$$

$$-3 \quad -8x \qquad -3 \quad -8x$$

$$33 = -116x$$

$$\frac{33}{-116} = \frac{-116x}{-116} \Rightarrow x = -\frac{33}{116}$$

$\left\{-\frac{33}{116}\right\}$

2.2 #63

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

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

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

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

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

$$\left(\frac{4}{3}\right)\frac{3}{4}x = \left(-\frac{9}{8}\right)\left(\frac{4}{3}\right)$$

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

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

2.2 #71

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

$$\frac{3}{2}y - y = -\frac{2}{3} - \frac{1}{3}$$

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

$$\frac{1}{2}y = -1$$

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

$$y = -2$$

$$\{-2\}$$

2.3: Solving Linear Equations (by combining additive & multiplicative properties)

Ex: Solve.

$$-3(y+7) - 2(-3y-1) = 5$$

$$-3y - 21 + 6y + 2 = 5$$

$$3y - 19 = 5$$

$$3y = 5 + 19$$

$$3y = 24$$

$$\frac{3y}{3} = \frac{24}{3}$$

$$y = 8$$

$$\{8\}$$

Ex: Solve.

$$-\frac{1}{2}(6-5x) = \frac{2}{3}\left(\frac{3}{4}+10x\right)$$

$$-\frac{1}{2}(6) - \frac{1}{2}(-5x) = \frac{2}{3}\left(\frac{3}{4}\right) + \frac{2}{3}(10x)$$

$$-\frac{6}{2} + \frac{5}{2}x = \frac{1}{2} + \frac{20}{3}x$$

$$-3 - \frac{1}{2} = \frac{20}{3}x - \frac{5}{2}x$$

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

$$-\frac{6}{2} - \frac{1}{2} = \frac{40}{6}x - \frac{15}{6}x$$

$$-\frac{7}{2} = \frac{25}{6}x$$

$$\left(\frac{6}{25}\right)\left(-\frac{7}{2}\right) = \frac{25}{6}x\left(\frac{6}{25}\right)$$

$$-\frac{21}{25} = x$$

$$\left\{-\frac{21}{25}\right\}$$

Example: Solve.

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

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

$$+8 \qquad +8$$

$$28x = 28x + 6$$

$$-28x \qquad -28x$$

$0 = 6$ False for every value of x.

So the original eqn is false for every x

No Solution

Solution Set: $\emptyset$

↑ "the empty set"

Example: Solve. $-2(3-x)+5x=7x-6$

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

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

$-7x \quad -7x$

$-6=-6$

$+6 \quad +6$

$0=0$ True for every value of x

So, the orignal eqn is true for every value of x

Sol'n set: **All real numbers**

Note:

* If all variables "cancel out" and leave you with a false statement, then there are no solutions.
* If all variables "cancel out" and leave you with a true statement, then the solution set is all real numbers.

In XYZ:

For "no solution", write DNE. (does not exist)

For "all real numbers", write oo (two lower case oh's)

Ex: Solve. $2(4x-3)=1+8x$

$8x-6=1+8x$

$-6=1$

$-7=0 \rightarrow$ False

No Solution

Ex: $2(4x-3) = 2x - 6$

$8x - 6 = 2x - 6$

$+6 \qquad +6$

$8x = 2x$

$-2x \qquad -2x$

$6x = 0$

$\frac{6x}{6} = \frac{0}{6}$

$x = 0$

Sol'n Set: $\{0\}$

Check it!

Note: $\frac{0}{5} = 0$

$\frac{5}{0}$ is undefined!

Why?

$\frac{30}{5} = ?$ is asking $5(?) = 30$

$\frac{30}{5} = 6$ because $5(6) = 30$

$\frac{0}{5} = ? \Rightarrow 5(?) = 0$

$\frac{0}{5} = 0$ because $5(0) = 0$

$\frac{5}{0} = ?$ is asking $0(?) = 5$

$\frac{5}{0}$ is undefined because $0(?) = 5$ is impossible.

Prereading Assignment (due Wed 9/2)

Read Section 2.5 (pp 183 - 188)

Rework Example 2. (p. 185)

work
↳ Similar Example:

One number is 4 more than twice another. Their sum is 22. Find the numbers

Use prereading worksheet on website.