

Homework Qs

Note Title

8/31/2015

2.1 # 11 | $x - 2 = 3x + 1$ is $\frac{-3}{2}$ a solution?

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

Ex: $\frac{-2}{8} = -\frac{1}{4}$
all are equal $\left\{ \begin{array}{l} \frac{2}{-8} = -\frac{1}{4} \\ -\frac{2}{8} = -\frac{1}{4} \end{array} \right.$

$$\begin{aligned} x - 2 &= 3x + 1 \\ x = \frac{-3}{2} &\Rightarrow \frac{-3}{2} - 2 = 3\left(\frac{-3}{2}\right) + 1 \\ \frac{-3}{2} - \frac{2}{1}\left(\frac{2}{2}\right) &= -\frac{9}{2} + \frac{1}{1}\left(\frac{2}{2}\right) \\ \frac{-3}{2} - \frac{4}{2} &= -\frac{9}{2} + \frac{2}{2} \\ \frac{-7}{2} &= -\frac{7}{2} \end{aligned}$$

True.

So Yes, this is a solution.

2.1 # 6 | $2x = 3x + 1$ Solve.

$$-x = 1$$

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

$$x = -1$$

$$\{-1\}$$

2.2 # 25 | $-\frac{3}{5}x = \frac{9}{5}$ Solve.

One way:
multiply by reciprocal
of the coefficient of x :

$$\left(-\frac{5}{3}\right)\left(-\frac{3}{5}x\right) = \left(\frac{9}{5}\right)\left(-\frac{5}{3}\right)$$

$$\frac{15}{15}x = -\frac{45}{15}$$

$$x = -3$$

Sol'n set:

$$\{-3\}$$

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Another way: $-\frac{3}{5}x = \frac{9}{5}$

multiply by 5: $\cancel{(-\frac{3}{5}x)} = \cancel{(\frac{9}{5})}$

$$-3x = 9$$

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

$$x = -3$$

$$\{-3\}$$

2.2 #5) $-8x = 4$ Solve.

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

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

Sol'n Set: $\{-\frac{1}{2}\}$

2.2 #69) $9y + 2 = 6y - 4$

$$3y + 2 = -4$$

$$3y = -6$$

$$\frac{3y}{3} = \frac{-6}{3}$$

$$y = -2$$

$$\{-2\}$$

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

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

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

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

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

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

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

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

2.2 #71)

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

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

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

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

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

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

$$y = -2$$

$$\{-2\}$$

2.3: Combining Properties (Solving Linear Equations)

Example: Solve.

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

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

$$3y - 19 = 5$$

$$3y = 24$$

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

$$y = 8$$

Check:

$$-3(8+7) - 2(-3(8)-1) = 5$$

$$-3(15) - 2(-24-1) = 5$$

$$-45 - 2(-25) = 5$$

$$-45 + 50 = 5$$

$$5 = 5 \checkmark$$

$$\{8\}$$

Sol'n Set

Ex:

Solve.

$$2(x-1) = 5x-2$$

$$2x - 2 = 5x - 2$$

$$-3x - 2 = -2$$

$$-3x = 0$$

$$\frac{-3x}{-3} = \frac{0}{-3}$$

$$x = 0$$

$$\text{Check: } 2(0-1) = 5(0)-2$$

$$2(-1) = 0-2$$

$$-2 = -2 \text{ True}$$

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

Recall: $\frac{0}{3} = 0$

$\frac{3}{0}$ is not defined.

Note: $\frac{8}{2} = 4$ because $2(4) = 8$

$\frac{24}{4} = 6$ because $4(6) = 24$

$\frac{24}{x} = ?$ $4(?) = 24$

$\frac{3}{0} = ? \Rightarrow 0(?) = 3$

$\frac{3}{0}$ is undefined because $0(?) = 3$ is impossible.

Ex:

Solve.

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

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

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

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

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

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

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

$$\frac{\cancel{6}^3}{25}\left(-\frac{7}{\cancel{2}_1}\right) = \left(\frac{25}{6}x\right)\left(\frac{\cancel{6}^6}{25}\right)$$

$$-\frac{\cancel{42}^{21}}{\cancel{50}_{25}} = 1x$$

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

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

Ex:

Solve.

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

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

$$28x = 28x + 6$$

$$0 = 6 \quad \text{False for every } x.$$

There are no x 's that make the original eqn true.

No Solution Solution set: $\emptyset$ the empty set

Ex: Solve.

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

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

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

$$7x = 7x$$

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

So the solution set for the original eqn is all real numbers.

Note:

* If all variables "cancel out" and leave you with a true statement, the solution set is all real numbers.

* If all variables "cancel out" and leave you with a false statement, there is no solution.

2.5: Applications of Linear Egn's

Write as an algebraic expression:

(a) 3 times a number $3x$

(b) 10 more than a number $x+10$

(c) 6 less than twice a number

$$2x - 6$$

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.