

Homework Qs

Note Title

8/26/2015

1.6
 (47) $-(2x+1) - \frac{1}{2}(x+5)$
 $= -1(2x+1) - \frac{1}{2}(x+5)$
 $= -2x-1 - \frac{1}{2}(x) - \frac{1}{2}(\underline{5})$
 $= -2x - \frac{1}{2}x - 1 - \frac{5}{2}$
 $= -\underline{\frac{2x}{1}(\frac{2}{2})} - \frac{1}{2}x - \underline{\frac{1}{1}(\frac{2}{2})} - \frac{5}{2}$
 $= -\frac{4}{2}x - \frac{1}{2}x - \frac{2}{2} - \frac{5}{2}$
 $= \boxed{-\frac{5}{2}x - \frac{7}{2}}$

1.6 #55

$$-6(\frac{1}{2}x - \frac{1}{3}y) + 12(\frac{1}{4}x + \frac{2}{3}y)$$

$$\underline{-6}(\frac{1}{2}x) - \underline{6}(-\frac{1}{3}y) + \underline{12}(\frac{1}{4}x) + \underline{12}(\frac{2}{3}y)$$

$$= -\frac{6}{2}x + \frac{6}{3}y + \frac{12}{4}x + \frac{24}{3}y$$

$$= -3x + 2y + 3x + 8y$$

$$= \boxed{10y}$$

Example:

Simplify

$$\frac{3}{4}(2x - \frac{1}{3}) - \frac{1}{3}(\frac{1}{2}x + 5)$$

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

$$= \frac{6}{4}x - \frac{3}{12} - \frac{1}{6}x - \frac{5}{3}$$

$$= \frac{3}{2}x - \frac{1}{6}x - \frac{3}{12} - \frac{5}{3}$$

$$= \frac{3}{2}x(\frac{2}{2}) - \frac{1}{6}x - \frac{3}{12} - \frac{5}{3}(\frac{4}{4})$$

$$= \frac{9}{6}x - \frac{1}{6}x - \frac{3}{12} - \frac{20}{12}$$

$$= \frac{8}{6}x - \frac{23}{12}$$

$$= \boxed{\frac{4}{3}x - \frac{23}{12}}$$

1.6
 (71) Evaluate for $x = -5$.

$$5(2x+1)+4$$

$$x = -5 \Rightarrow 5(2(-5)+1)+4$$

$$= 5(-10+1)+4$$

$$= 5(-9)+4$$

$$= -45+4$$

$$= \boxed{-41}$$

(73) Evaluate for $x = -3$ and $y = 5$.

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

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

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

$$= 9 + 30 + 25$$

$$= 39 + 25$$

$$= \boxed{64}$$

Ex:

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

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

$$= -9 + 30 + 25$$

$$= 21 + 25 = \boxed{46}$$

Important Note:

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

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

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

$$\begin{aligned} -(-3)^3 &= -(-3)(-3)(-3) \\ &= -(9(-3)) \\ &= -(-27) \\ &= \boxed{27} \end{aligned}$$

$$\text{Ex: } (-2)^4 = \underbrace{(-2)(-2)}_{+} \underbrace{(-2)(-2)}_{+} = 4(4) = \boxed{16}$$

$$(-2)^5 = \underbrace{(-2)(-2)}_{+} \underbrace{(-2)(-2)}_{+} (-2) = 4(4)(-2) = 16(-2) = \boxed{-32}$$

Chapter 2: Solving Linear Equations

2.1: Additive Property of Equality

An equation consists of 2 algebraic expressions joined by an equals sign. An equation is a statement.
(can be true or false)

To solve an equation means to find the solutions. A solution is a value of the variable that makes the equation true.

A linear equation: variables to 1st power only.

Ex: Is -3 a solution to $2x - 4 = 2$?

$$\begin{aligned} \text{check: } 2(-3) - 4 &= 2 \\ -6 - 4 &= 2 \end{aligned}$$

$$-10 = 2 \quad \text{False.}$$

No, -3 is not a solution.

Previous example cont'd:

Is 3 a solution to $2x - 4 = 2$?

$$2(3) - 4 = 2$$

$$6 - 4 = 2$$

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

Yes, 3 is a solution.

Additive Property of Equality

If $a = b$, then $a + c = b + c$.

In other words, we can add (or subtract) the same quantity on both sides.

Example: Solve.

$$\underset{-6}{6} + x = \underset{-6}{-2}$$

$$x = -2 - 6$$

$$x = -8$$

Sol'n Set: $\{-8\}$

xyz: write $x = -8$

Never write $\{x = -8\}$

Solve.

Ex: $2x - 7 = 6 + 3x$

$$\underset{-6}{-7} = \underset{-6}{6} + x$$

$$\underset{-13}{-13} = x$$

Sol'n
Set:

$$\{-13\}$$

Check:

$$2x - 7 = 6 + 3x$$

$$x = -13 \Rightarrow 2(-13) - 7 = 6 + 3(-13)$$

$$-26 - 7 = 6 - 39$$

$$-33 = -33 \checkmark \text{ OK}$$

Ex.: Solve.

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

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

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

$$1x = -\frac{25}{30} - \frac{24}{30}$$

$$x = -\frac{49}{30}$$

Sol'n Set: $\left\{-\frac{49}{30}\right\}$

Note: Suppose you solve and get $-x = \frac{49}{30}$.

$$\text{Then } x = -\frac{49}{30}$$

2.2: Multiplicative Property of Equality

Example: What value of x solves $3x = 12$?

$$\text{Try } x=4: 3(4) = 12$$
$$12 = 12 \checkmark$$

Multiplicative Property of Equality

If $a=b$, then $ac=bc$ for all $c \neq 0$.

This means we can multiply (or divide) by the same non zero number on both sides.

Ex.: Solve $3x = 12$

$$\frac{3x}{3} = \frac{12}{3}$$

$$1x = 4$$

Sol'n Set: $\{4\}$

Ex:

Solve.

$$-4x - 1 = 47$$

$$-4x = 48$$

$$\frac{-4x}{-4} = \frac{48}{-4}$$

$$x = -12$$

Sol'n set: $\{-12\}$

Ex:

Solve.

$$\frac{2}{3}x = 7$$

$$\frac{\frac{2}{3}x}{\frac{2}{3}} = \frac{7}{\frac{2}{3}}$$

$$x = \frac{7}{1} \cdot \frac{3}{2}$$

$$x = \frac{21}{2}$$

Recall: Dividing by a number is the same as multiplying by its reciprocal.

Ex:

Solve.

$$-\frac{7}{4}x = -\frac{3}{5}$$

$$\left(-\frac{4}{7}\right)\left(-\frac{7}{4}x\right) = -\frac{3}{5}\left(-\frac{4}{7}\right)$$

$$1x = \frac{12}{35}$$

$$\boxed{\left\{\frac{12}{35}\right\}}$$