Name: ____________________________ Date: ______________

LINEAR EQUATION SOLVING – A REVIEW
COMMON CORE ALGEBRA I

The expectation of the Common Core is that students have mastered solving all types of linear equations in 8th grade Common Core mathematics. In this lesson, we simply present a variety of linear equations for you to practice solving.

***Exercise* #1:** Solve each of the following "two-step" linear equations. Keep in mind, this is what we were doing in the last lesson by reversing the operations that had occurred to the variable. Some of these answers will be non-integer **rational** numbers. Simplify where possible.

(a) $\frac{x}{3}-7=-2$

(b) $4x+3=-17$

(c) $5x+12=87$

(d) $\frac{x+7}{3}=2$

(e) $-6(x-1)=18$

(f) $8x+2=-2$

(g) $\frac{3}{4}x-5=4$

(h) $-\frac{5}{2}x+6=1$

(i) $6x+3=-1$

For most of what we do the rest of the way, you will be using the distributive property as well as others to solve the problems. Don't forget our primary technique of solving by reversing the operations that have been done to our variable. This technique is particularly useful when **the variable shows up only once!**

***Exercise* #2:** Solve the following equation for x by identifying the operations that have been done to x and reversing them.

$$\frac{5(x-3)}{8}+2=7$$

Reverse them!

Operations?

O.k. Now we move onto problems where this technique is used, but only towards the end. We also need to review how to solve problems where the variable shows up more than once. Since this is review, we will jump right into the most complex scenario.

***Exercise* #3:** Consider the equation $5(x-3)+2x=4(x+3)$.

(a) By using the distributive property, write equivalent expressions for both sides of the equation. Show the work below.

(b) Solve the equation for x. Check to make sure the **original equation** has a true value for the x you find.

***Exercise* #4:** Get more practice on these more complicated equations. Check that your final answer makes the equation true. Generally, use the distributive property when needed.

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

(b) $9-6(x+1)=2(x-4)+27$

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LINEAR EQUATION SOLVING – A REVIEW
COMMON CORE ALGEBRA I HOMEWORK

FLUENCY

1. Solve the following equations for x using inverse operations.

(a) $7x-15=1$ (b) $\frac{x+2}{4}=-2$ (c) $-\frac{3}{5}x+2=7$

2. Solve the equation for x. Check to make sure the **original equation** has a true value for the x you find.

(a) $\frac{5(x+1)+4}{6}=4$ (b) $\frac{5(x-3)}{8}+2=7$

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

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

APPLICATIONS

In the real world many scenarios may be modeled with linear equations like the ones you've seen so far. Sometimes, though, linear models may not give **viable** results, and we must interpret the answer we find. To see an example of this, let's look at the following.

3. A tile warehouse has Inventory at hand and can put in for a back order from a supplier of bundles of tiles. Currently they have 38 tiles of a certain kind in stock, and can only order more in groups of 12 tiles per bundle. The equation that represents this order is as follows;

The number of tiles $=12b+38$, where b is the number of bundles ordered.

(a) If a customer needs 150 tiles, how many bundles will need to be ordered? Explain how you got your answer. Why do we need to round our answer up in this problem?

(b) If the store likes to keep 30 tiles in stock at all times how many bundles do they need to order now, after selling the 150 tiles to the customer? Think about how many you had left over from the customer who ordered 150 tiles.

REASONING

4. Look through the following work, find the mistake, and circle it. Then, to the side, show the appropriate work.

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

$$5\cdot\frac{-2(x-3)}{5}=4\cdot 5$$

$$-2(x-3)=20$$

$$-2x-6=20$$

$$-2x-6+6=20+6$$

$$-2x=26$$

$$\frac{-2x}{-2}=\frac{26}{-2}$$

$$x=-13$$