Algebra Review 1- Linear Functions
Simplifying & Solving

<u>**Standard:**</u>   **A-REI.B.3**   **A-REI.C.6**

<u>**GLOs:**</u> **#1-**Self Directed Learner & **#4-**Quality Producer

<u>**Math Practices:**</u> **-**Attend to Precision
-Look for and express regularity in repeated reasoning

<u>**HW#1:**</u> Alg Rev 1 ws #1-3

<u>**Learning Target:**</u>
- What is the process for solving an equation for x?

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Order of Operations (PEMDAS):

PE M A
  D S

() [] {}   (erase to show)

1. Do operations that occur within **grouping** symbols.
2. Evaluate **exponents** .
3. Do multiplications and divisions from **left** to **right** .
4. Do additions and subtractions from **left** to **right** .

Evaluate the following expressions for the given value of x.

1) $\dfrac{3}{4}x - 7$ when $x = 8$

$$\frac{3}{4}\left(\frac{8}{1}\right) - 7$$

$$\frac{24}{4} \quad -7$$

$$6 \quad -7$$

$$\boxed{-1}$$

2) $x^2 - 4(x - 3) \div 2$ when $x = -5$

$$(-5)^2 - 4\big((-5) - 3\big) \div 2$$

$$25 - 4(-8) \div 2 \qquad 25 - 4(-8) \div 2$$

$$25 + 32 \div 2 \qquad 25 + +32 \div 2$$

$$25 + 16$$

$$\boxed{41}$$

3) $\dfrac{2x - x^2}{x + 3}$ when $x = 7$

$$\frac{2(7) - (7)^2}{(7) + 3}$$

$$\frac{14 - 49}{10}$$

$$\frac{-35}{10}$$

$$\boxed{-\frac{7}{2}}$$

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2

Simplify Expressions (Combining like terms)

Like Terms have the same __**variables**__ raised to the same __**exponents**__ .

An expression is completely **simplified** if it has __**no**__ __**grouping**__ symbols, and if all the __**like**__ __**terms**__ have been __**combined**__ .

Simplify the expression.

4) $4x + 3y - 2x + 5y + x$

$$\boxed{3x + 8y}$$

5) $3\left(x^2 - 2x\right) - 5\left(2x^2 - x\right)$

$$3x^2 - 6x - 10x^2 + 5x$$

$$\boxed{-7x^2 - x}$$

(erase to show)

Solving Linear Equations

1. Use the __**distributive**__ property to __**clear**__ any grouping symbols.

2. Use the addition and subtraction __**property**__ __**of**__ __**equality**__ to get all terms containing the variable on __**one**__ __**side**__ of the equation and all other terms on the other side, __**combining**__ __**like**__ __**terms**__ along the way.

3. Use the multiplication and division property of equality to __**isolate**__ the variable.

4. Check the solution by __**substituting**__ into the original equation.

Solve the equation.

6) $-x + 5 = 6$

$\quad\quad \underline{-5 \quad -5}$

$\quad\quad \dfrac{+x}{+1} = \dfrac{1}{-1}$

$\quad\quad \boxed{x = -1}$

$\sqrt{:}$

$+(+1) + 5 = 6$

$\quad 1 + 5 = 6$

$\quad\quad 6 = 6$

$\quad\quad\quad \checkmark$

7) $\left(4x + \dfrac{1}{2}\right) = \left(3x - \dfrac{5}{2}\right) 2$

$8x + 1 = 6x - 5$

$-6x \quad\quad -6x$

$\quad\quad \overline{ \quad -1}$

$\dfrac{2x}{2} = \dfrac{-6}{2}$

$\boxed{x = -3}$

8) $2(7 - x) = 6(1 + 2x)$

$14 - 2x = 6 + 12x$
$+2x \qquad +2x$
$-6 \qquad\quad -6$

$\dfrac{8}{14} = \dfrac{14x}{14}$

$\boxed{x = \dfrac{4}{7}}$

OR

9) $\dfrac{1}{3}(9x - 27) = 5 - 3x$

$3x - 9 = 5 - 3x$
$+3x \qquad\qquad +3x$
$+9 \qquad +9$

$\dfrac{6x}{6} = \dfrac{14}{6}$

$\boxed{x = \dfrac{7}{3}}$

9) $3\left[\dfrac{1}{3}(9x - 27)\right] = (5 - 3x)\,3$

$9x - 27 = 15 - 9x$
$+9x \qquad\qquad +9x$
$+27 \quad +27$

$\dfrac{18x}{18} = \dfrac{42}{18}$

$x = \dfrac{21}{9}$

$\boxed{x = \dfrac{7}{3}}$

10) $-(x - 5) = 2(3x - 1)$

$-x + 5 = 6x - 2$
$+x \qquad\quad +x$
$+2 \qquad +2$

$\dfrac{7}{7} = \dfrac{7x}{7}$

$\boxed{x = 1}$