Dear Parents,

Attached is the homework for Monday, March 23 (it states unit test but this is NOT a test and is only being used to review first semester topics)

The attached EOC review covers the following topics:

***Rational Numbers:***  The symbol for rational numbers is the capital letter ***Q***

***Rational Numbers*** can be written in the form a/b;  b cannot equal zero because

                              cannot divide by zero

                                   A) can be written as a terminating decimal (stops)

                                       Example 0.7

                                   B)  can be written as a fraction

                                        Example:  1/2

                                   C)  can be written as a repeating decimal (***repeat begins with r and rational***

***begins with r)***

                                        Example:  0.333333....

                                        Example:  0.12341234....

***Rational Numbers***include the following:

***Integers:***  {..., - 2, - 1, 0, 1, 2, ...};

***Whole Numbers:***  {0, 1, 2, 3, ...}

                             **(*Whole has a zero in the middle of the word***)

***Natural Numbers:***{1, 2, 3, 4, ...}

                              ***( When you ask a kid to count, they naturally start with one)***

The last group of numbers does not belong to the above categories:  ***Irrational Numbers:***

***Irrational Numbers:***  The symbol for irrational numbers is the capital letter ***I***

***does not*** meet the requirements of a rational number

                                    Examples:  ,  , , **π**

**Students should type the numbers into the calculator to see the decimal form of the answer to help determine the classification of the number as well as to determine where the number goes on the number line. This can be done by using the wavy button (which is right above enter).**

**In addition, students should remember that on a number line, negative numbers go to the left of zero and positive numbers go to the right of zero.**

**Students should know the following buttons on the TI 36XPRO calculator as we have been practicing using these buttons in class:**

**2nd,****: These 2 buttons will give the square root symbol which is**

(-) : This button is left of the enter button and is the negative sign

: This button is the fraction button and is found above the 7 (would use scroll button to get to the bottom part of the fraction)

2nd, 7: These 2 buttons allow you to type in a mixed fraction such as 

Math, scroll to the right and highlight NUM and choose option 1 will allow you to type in absolute value

***Absolute value*** means the distance from zero and should always be positive (unless there is negative sign outside the absolute value bars)

***Opposite***of a number is the same distance from zero (opposite sides of zero on the number line. So, opposite just means to change the sign of a number.

***Key Word Operations:***

Words that mean ***addition*** are as follows: Plus, Increased, more than,

                                                            sum, add, altogether, total

Words that mean ***subtraction*** are as follows: Minus, Decreased, less than (remember

                                                                   to switch order), difference, take away

Words that mean ***multiplication*** are as follows: Times, Twice (2), Triple (3), Product,

                                                                      Double (2), of

Words that mean ***Division***are as follows: Quotient, per, divided by

Words that mean ***equals*** are as follows: is, was

Words that mean ***greater than*** are as follows:  is more than

Words that mean ***greater than or equal to*** are as follows:  is greater than or equal to,

                                                                                       at least, is no less than (means no

                                                                                       don’t put less than),

                                                                                       a minimum number

Words that mean ***less than*** are as follows:  is less than

Words that mean ***less than or equal to*** are as follows:  is less than or equal to, at most,

                                                                                  is no more than (means no don’t put

                                                                                  greater than), a maximum number

Students must know what the ***constant*** (flat fee) is to be able to set up the model or the equation. This is the number that will not change regardless. If the word each or per is stated in the word problem, then this means the " x " amount (the amount that changes) so this number should be next to x.

In addition, students should know the following terms:

***Perimeter:*** means add up all the sides

***Consecutive Integers:*** means in a row or one right after the other (Example: 7 and 8 are consecutive integers) If looking for two consecutive integers, then use x and x + 1

***Averages:*** means Add up all the grades or scores, then divide by the total number of grades or scores

***Dimensions:*** means length and width

***Examples are as follows:***
Six more than a number                        x + 6 or 6 + x

Six less than a number                          x - 6

Half of a number increased by two          x + 2

The quotient of a number and 8              

Six is less than a number                       6 < x

Six is more than a number                     6 > x

The product of six and a number is twelve           6x = 12

A number is no less than 18   x > 18

A number is no greater than 18   x < 18

To be classified as***like terms***, the terms must have the***same variable***and the ***same exponent***.  To combine, just add or subtract the coefficients (do not change the variable or exponent). Make sure your answers are in alphabetical order and descending order (standard form) alphabetically.

Example:  2x - x = x

Example:  a + a + 3b + b = Like terms are: a and a; 3b and b which gives:  **2a + 4b**

Example:  3ab + 4a - 2ab = Like terms are:  3ab – 2ab; which gives:  **ab + 4a**

Example:  2 - 5x + 8 + 5x - 8 = **2**as the x terms cancel out

Example:  - 3x + 3x = **0**

Example:   + x – 8 +  – 5x = **– 4x - 8**

***Combining Like Terms and the Distributive Property:***

To be classified as***like terms***, the terms must have the***same variable***and the ***same exponent***;

otherwise, the terms are not like terms. Students will enter the coefficients (the number in front of the variable) into the calculator and then place the appropriate variable next to that answer that the calculator has given  To combine, just add or subtract the coefficients (do not change the variable or exponent). Make sure your answers are in alphabetical order and descending order (standard form) alphabetically.

Example:  2x - x = x

Example:  a + a + 3b + b = 2a + 4b

Example:  3ab + 4a - 2ab = ab + 4a

Example:  2 - 5x + 8 + 5x - 8 = 2 as the x terms cancel out

 ***Distributive Property***: A(B + C) = AB + AC

Distribute means to multiply the term outside the parenthesis to ***each*** term inside the parenthesis. Students can use the party method (students will know to use ***party*** method when there is ***parenthesis***)

The term at the door (whatever is next to the parenthesis) must meet everybody in the house (the house is the parenthesis). When you ***meet,***you ***m***ultiply. Multiply the coefficients. Combine like terms if possible after distributing.

***Example 1***: 2(x + 1) = 2x + 2        2 is at the door and meets x first which gives 2x and then 2 meets 1 so 2 \* 1 = 2

***Example 2***:  3(4x - 5y - 6) =   12x - 15y - 18         3 is at the door and meets 4x first which gives 12x; then 3 meets - 5y which gives - 15y; last 3 meets - 6 which gives - 18

***Example 3***:   8x ( -  + 3x – 1)              8x is at the door and meets  which gives – 56 -



                                                            8x is at the door and meets 3x which gives 24

                                                            8x is at the door and meets – 1 which gives – 8x

The final answer is:            – 56   + 24 – 8x

***Example 4***:  7 - 8(2x - 9) = 7 - 16x + 72 = - 16x + 79       - 8 is at the door and meets 2x which gives - 16x; - 8 meets - 9 which gives 72; then combine like terms of 7 and 72 which gives 79

***Example 5***: 8(3x + 4) – 7x (3 + 4x + 5)

Distributing gives the following:

24 + 32 – 21 - 28  - 35x

Combine like terms which are 24 and – 21 which gives 3

Combine like terms which are 32 and - 28 which gives 4

Attach the - 35x at the end

So, the final answer is 3 + 4 - 35x

***Solving One-step Equations:***

To solve equations, remember to do the opposite. For students who are struggling, then putting the letter in a box is the best way to begin a problem. Students must get the box on a side by itself.  So, the opposite of adding is subtracting; the opposite of subtracting is adding; the opposite of multiplying is dividing; and the opposite of dividing is multiplying.

***Example 1***:  x – 7 = - 8            So, add 7 to both sides of the equal sign. So, x = - 8 + 7 which is – 1

***Example 2***:  x + 14 = 21           So, subtract 14 from both sides of the equal sign. So, x = 21 – 14

                                                    which is ***7***

***Example 3***:  - 18 = x – 7          So, add 7 to both sides of the equal sign. So, x = - 18 + 7

                                                    which is ***– 11***

***Example 4***:   22 = x – ( - 5)     Two negative signs next to each other make a positive. So, rewrite

                                                   the problem:  22 = x + 5         So, subtract 5 from both sides of the

                                                   equal sign. So, x = 22 – 5 which is ***17***

***Example 5***:  - 26 = x + ( - 13 )   Plus a negative means the same as minus. So rewrite the

                                                      problem:   - 26 = x – 13            So, add 13 to both sides of the

                                                     equal sign. So, x = - 26 + 13 which is ***– 13***

***Example 6:******= - 14***So, multiply both sides of the equal sign by 19 (because it is the

                                                   number with x)          So, x = 19 \* - 14  which is – 266

                                                  or divide both sides by  ; So, - 14/  = - 226

***Example 7***:  - 55 = - 5x         So, divide both sides of the equal sign by – 5 (because it is the

                                                 number with x)             So, x = - 55 / - 5 which is 11

***Example 8***:   = x             So, divide both sides of the equal sign by   (because it is the

                                                    number with x)            So, x =   divided by    which is 

***Example 9***:  The sum of a number and 3 is – 2. Find the number.

                      Sum means add, a number means the variable (x), and is means =

                     So, the equation would be:  x + 3 = - 2

                     So, subtract 3 from both sides of the equal sign which gives x = - 2 – 3 = - 5

***Example 10***:  If you decrease a number by 4, the result is – 5. Find the number

                         Decrease means subtract, a number means the variable, and is means =

                         So, the equation would be:  x – 4 = - 5

                         So, add 4 to both sides of the equal sign which gives x = - 5 + 4 = - 1

***Example 11***:  The product of a number and 5 is – 35.

                          Product means multiply, a number means the variable, and is means =

                          So, the equation would be:  5x = - 35

                          So, divide both sides of the equal sign by 5 which gives x =  = - 7

***Example 12:***  The quotient of a number and – 4 is 5. What is the number?

                         Quotient means divide, a number means the variable, and is means equals

                          So, the equation would be:   = 5

                          So, multiply both sides of the equal sign by – 4 which gives x = 5 \* - 4 = - 20

                     Or, divide both sides by ; So, 5/  = - 20

***Literal Equation Examples:***

***Example 1:***  Solve for a:  a + b = c

                      So, to get a on a side by itself, get rid of b.

                      So, subtract b from both sides of the equal sign which gives:  a = c – b

                      C and b are not like terms so these terms cannot be subtracted so leave as it is

***Example 2:***  Solve for d:  d – e = f

                       So, to get d on a side by itself, get rid of e.

                       So, add e to both sides of the equal sign which gives d = f + e

                       F and e are not like terms so these terms cannot be added so leave as it is

***Example 3:***  Solve for r:  C = 2**πr**

**So, to get r on a side by itself, get rid of**2**π**

**So, divide by**2**π on both sides of the equal sign which gives****= r**

***Example 4:***  Solve for m:  D = 

                      So, to get m on a side by itself, get rid of v

                      So, multiply by v on both sides of the equal sign which gives dv = m

***Steps to solving multi-step equations***:

1. Parenthesis? Distribute
2. Crowd Control? Count/Combine like terms if necessary
3. Move Variables (to left when possible)
4. Move Numbers (to right when possible
5. Multiply or Divide to solve for x

***Steps to solving multi-step equations:***1) Party? Parenthesis? If so distribute. Remember the person at the door has to meet (multiply) everybody in the house.

2) Crowd Control? Count how many terms are on each side of the equal sign. If there are more than two terms on either side of the equal sign, then you must combine like terms. Remember, do ***not*** change signs when combining like terms on the ***same side of the equal sign.***

3) ***L***etters to ***L***eft (Remember this because both start with the letter ***L***):  Once like terms have been combined on both sides of the equal sign, then move the variables (letters) to one side of the equal sign by adding or subtracting.

4) Then move the numbers to the right side of the equal sign by adding or subtracting

5) Divide or multiply by the number next to x to both sides of the equal sign to solve for x.

***Example 1***:  5x – 3 = 17        So, add 3 to both sides of the equal sign and this gives 5x = 20. Divide

                                          both sides of the equal sign by 5 which gives x = 4

***Example 2***:  - 7 = 8 – 3x       So, subtract 8 from both sides of the equal sign and this gives  - 15 = - 3x

                                          Divide both sides of the equal sign by – 3 which gives x = 5

***Example 3***:        – 6 = - 11              So, add 6 to both sides of the equal sign and this gives  = - 5.

                                                      Multiply both sides by 2 which gives x = - 10

***Example 4:***7(4x + 5) = 175          So, distribute the 7 to each term in parenthesis; 7 meets 4x which

                                                       gives 28x and 7 meets 5 which gives 35 so 28x + 35 = 175

                                                      So, subtract 35 from both sides of the equal sign which gives

                                                      28x = 140. Divide both sides of the equal sign by 28 which gives

                                                       x = 5

***Example 5:***  272 = 8(- 5x – 5) – 8        So, distribute 8 to each term in parenthesis; 8 meets – 5x which

                                                          gives – 40x and 8 meets – 5 which gives – 40  which gives

                                                          272 = - 40x – 40 – 8

                                                         Combine like terms on the right side of the equal sign so

                                                       – 40 – 8 = - 48

                                                       This gives 272 = - 40x – 48       So, add 48 to both sides of the

                                                        equal which gives 320 = - 40x

                                                        So, divide both sides of the equal sign by – 40 which gives x = - 8

***Example 6***:   - x + 2 = - 2x – 3       So, add 2x to both sides of the equal sign which gives 1x + 2 = - 3

                                                   Subtract 2 from both sides of the equal sign which gives x = - 5

***Example 7***:  17 – 3x = 7x – 13        So, subtract 7x to both sides of the equal sign which gives

                                                  17 – 10x = - 13

                                                   Subtract 17 from both sides of the equal sign

                                                   which gives – 10x = - 30

                                                    Divide both sides of the equal sign by – 10 which gives 3

***Example 8:***    3x - 5x = 2          Combining the x terms would give the following:  - 2x = 2

                                                Divide both sides of the equal sign by – 2 which gives x = - 1

***Example 9:*** 3x = 5x + 10          Subtract 5x from both sides of the equal sign which gives   - 2x = 10

                                                  Divide both sides of the equal sign by – 2 which gives x = - 5

***Example 10:***  Three more than the product of a number and 4 is 15. Find the number.

                     More than means add, product is multiply, a number means the variable, x and is means =

                     3 + 4x = 15       Subtract 3 from both sides of the equal sign which gives 4x = 12

                                              Divide both sides of the equal sign by 4 which gives x = 3

***Example 11:***  Five less than three times a number is 1. Find the number.

                      Less than means subtract and opposite order that you see it, a number means the

                      variable x, and is means =

                      3x – 5 = 1              Add 5 to both sides of the equal sign which gives:  3x = 6

                                                   Divide both sides of the equal sign by 3 which gives x = 2

***Example 12:***The product of 2 and a number is increased by 9. The result is – 17

                        Product means multiply, a number means the variable, x and is means =

                         2x + 9 = - 17        Subtract 9 from both sides of the equal sign which gives:  2x = - 26

                                                    Divide both sides of the equal sign which gives x = - 13

***Example 13:***    = a; Solve for  b

                       Multiply both sides by 7 which gives:  b – 4x = 7a

                        Add 4x to both sides which gives: b = 7a + 4x

***Example 14:***  a(y + 1) = b; Solve for y

                      Divide both sides by a which gives:  y + 1 = 

                      Subtract 1 from both sides which gives:  y =  – 1

***Example 15:***  6x + 12y = - 18; Solve for x

                      Subtract 12y from both sides which gives:  6x = - 18 - 12y

                      Divide both sides by 6 which gives:  x =  - 

                      Reduce each fraction which gives:  x = - 3 – 2y

***Proportions***

A ***proportion*** is a piece of something to the whole thing; equivalent fractions; can be used to compare two different characteristics about the same item.

To solve a proportion, cross multiply. This means the numerator of one fraction times the denominator of the other fraction. Do this twice and set the answer from each cross multiply equal to each other. Then solve the equation (usually dividing by the number in front of the variable).

***Example 1:***

 = 

   Cross multiply so 3x = 2(9) which means 3x = 18; Divide both sides of the equal sign by 3 which gives x = 6

***Example 2:***

 =

When there is a + or -, then put parenthesis around that part

Cross multiply so 5(2x + 1) = 2(x + 2)

 Distribute 5 so 5 \* 2x = 10x and 5 \* 1 = 5 so this gives 10x + 5

 Distribute 2 so 2 \* x = 2x and 2 \* 2 = 4 so this gives 2x + 4

So:  10x + 5 = 2x + 4         Subtract 2x from both sides of the equal sign which gives 8x + 5 = 4

                                           Subtract 5 from both sides of the equal sign which gives 8x = - 1

                                           Divide both sides of the equal sign by 8 which gives x = 

When solving word problems, the fractions must have the same units in the same place meaning:

Example:  Things/money = Things/Money

Example:  Width/height = Width/height

The unknown (what you are trying to find) will be represented  by x. Then follow the steps above to solve the proportion.  Students must label the answers with the appropriate unit when solving word problems.

Below are websites with videos explaining most of the concepts covered last semester. The notes I attached to the previous emails provide some examples that cover some of the concepts as well. Please use the websites below if students need a “refresher” of concepts learned first semester.

***Solving Equations***:  <https://www.youtube.com/watch?v=Z-ZkmpQBIFo>

                                   <https://www.khanacademy.org/math/algebra-home/alg-basic-eq-ineq/alg-two-steps-equations-intro/v/steps-when-solving-equations>

                                  [https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:solve-equations-inequalities/x2f8bb11595b61c86:linear-equations-variables-both-sides/v/equations-3](https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86%3Asolve-equations-inequalities/x2f8bb11595b61c86%3Alinear-equations-variables-both-sides/v/equations-3)

***Solving Inequalities***:  <https://www.google.com/search?q=Solving+Inequalities&rlz=1C1GCEA_enUS857US857&oq=Solving+Inequalities&aqs=chrome..69i57.7220j0j9&sourceid=chrome&ie=UTF-8#kpvalbx=_LDdxXoLQKuu7tgXRsZ2YCQ35>

                                     <https://www.youtube.com/watch?v=VgDe_D8ojxw>

***Plotting Points***:  <https://www.khanacademy.org/math/basic-geo/basic-geo-coord-plane/coordinate-plane-4-quad/v/plot-ordered-pairs>

                             <https://www.youtube.com/watch?v=s7NKLWXkEEE>

***Finding slope or rate of change***: [https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:linear-equations-graphs/x2f8bb11595b61c86:slope/v/slope-of-a-line](https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86%3Alinear-equations-graphs/x2f8bb11595b61c86%3Aslope/v/slope-of-a-line)

                                                         <https://www.youtube.com/watch?v=R948Tsyq4vA>

***Graphing using x and y-intercepts***:  <https://www.google.com/search?q=Graphing+linear+Equations&rlz=1C1GCEA_enUS857US857&oq=Graphing+linear+Equations&aqs=chrome..69i57.4547j0j4&sourceid=chrome&ie=UTF-8#kpvalbx=_TDhxXqKEKor0tAa947GQCA60>

***Graphing using y = mx + b***:   [https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:forms-of-linear-equations/x2f8bb11595b61c86:standard-form/v/plotting-x-y-relationships](https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86%3Aforms-of-linear-equations/x2f8bb11595b61c86%3Astandard-form/v/plotting-x-y-relationships)

***Systems of Equations***: Remember this can be done on TI 36 XPRO calculator using 2nd tan buttons

                                        <https://www.khanacademy.org/math/algebra-home/alg-system-of-equations/alg-equivalent-systems-of-equations/v/solving-systems-of-equations-by-elimination>

***Simplifying Radicals***:  <https://www.google.com/search?rlz=1C1GCEA_enUS857US857&ei=ADlxXtCDJMGFtQaGwYzwBg&q=Simplifying+Radicals&oq=Simplifying+Radicals&gs_l=psy-ab.3..0l10.4172.8904..9051...1.1..0.133.1707.18j2......0....1..gws-wiz.....2..0i71j0i362i308i361i357j0i67j0i273.Z2EFo8BSg5k&ved=0ahUKEwjQg6WgsqLoAhXBQs0KHYYgA24Q4dUDCAs&uact=5#kpvalbx=_lzlxXsbJLtC8tAaWkZrACw72> (ignore cube roots)

***Adding/Subtracting Radicals***:  <https://www.youtube.com/watch?v=MKwxPbITcXQ>

***Exponent Rules***:  <https://www.youtube.com/watch?v=b4mSqcJND3I>

                               [https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:rational-exponents-radicals/x2f8bb11595b61c86:exponent-properties-review/v/multiplying-and-dividing-powers-with-integer-exponents](https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86%3Arational-exponents-radicals/x2f8bb11595b61c86%3Aexponent-properties-review/v/multiplying-and-dividing-powers-with-integer-exponents)

***Adding/Subtracting Polynomials:***  <https://www.google.com/search?rlz=1C1GCEA_enUS857US857&ei=kTxxXsqoPMqOtQWYvIhA&q=adding+and+subtracting+polynomials&oq=adding+and+subtracting+polyn&gs_l=psy-ab.1.0.0l10.1111.4336..7086...1.2..0.117.1042.13j1......0....1..gws-wiz.......0i71j0i67.Pg2GVypWeKM#kpvalbx=_mjxxXqLCCcHusQXk9pYY24>

***Multiply Polynomials***:  <https://www.youtube.com/watch?v=wUYa2NAV5t4>