Topic :   **ALGEBRA**

Sub-Topic: **ALGEBRA- LINEAR EQUATION**
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a. Definition: A linear equation in one unknown is an equation in which the only exponent on the unknown is 1.
b. The General Form of a basic linear equation is ax + b = c.
c. To Solve: the goal is to write the equation in the form variable = constant.
d. The solution to an equation is the set of all values that check in the equation

Step 1: Simplify each side, if needed.

- This would involve things like removing ( ), removing fractions, adding like terms, etc.
- To remove ( ): Just use the distributive property found in Tutorial 5: Properties of Real Numbers.
- To remove fractions: Since fractions are another way to write division, and the inverse of the divide is to multiply, you remove fractions by multiplying both sides by the LCD of all of your fractions.

Step 2: Use Add./Sub. Properties to move the variable term to one side and all other terms to the other side.

Step 3: Use Mult./Div. Properties to remove any values that are in front of the variable.

Step 4: Check your answer.

I find this is the quickest and easiest way to approach linear equations.

Example 1: Solve for the variable.   10 - 3x = 7.

$10 - 3x = 7$ ***Inverse of add. 10 is sub. 10**
$10 - 3x - 10 = 7 - 10$
$-3x = -3$

$\dfrac{-3x}{-3} = \dfrac{-3}{-3}$ ***Inverse of mult. by -3 is div. by -3**

$x = 1$

Be careful going from line 4 to line 5. Yes, there is a negative sign. But, the operation between the -3 and x is multiplication, not subtraction. So

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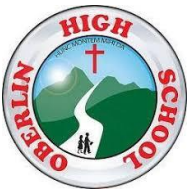
if you were to add 3 to both sides you would have ended up with -3x + 3 instead of the desired x.

If you put 1 back in for x in the original problem you will see that 1 is the solution we are looking for.

Example 2: Solve for the variable.   2(x + 5) – 7 = 3(x – 2).

$2(x + 5) - 7 = 3(x - 2)$
$2x + 10 - 7 = 3x - 6$
$2x + 3 = 3x - 6$
$2x + 3 - 3x = 3x - 6 - 3x$
$-x + 3 = -6$
$-x + 3 - 3 = -6 - 3$
$-x = -9$
$\dfrac{-x}{-1} = \dfrac{-9}{-1}$
$x = 9$

*Remove ( ) by using dist. prop.

*Get all x terms on one side

*Inverse of add. 3 is sub. 3

*Inverse of mult. by –1 is div. by –1

If you put **9** back in for x in the original problem you will see that **9** is the solution we are looking for.

Example 3:   Solve for the variable: $\dfrac{5}{4}x + \dfrac{1}{2} = 2x - \dfrac{1}{2}$.

$\dfrac{5}{4}x + \dfrac{1}{2} = 2x - \dfrac{1}{2}$
$(4)\left(\dfrac{5}{4}x + \dfrac{1}{2}\right) = (4)\left(2x - \dfrac{1}{2}\right)$
$5x + 2 = 8x - 2$
$5x + 2 - 8x = 8x - 2 - 8x$
$-3x + 2 = -2$
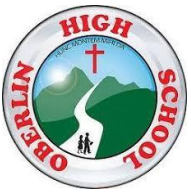$-3x + 2 - 2 = -2 - 2$
$-3x = -4$
$\dfrac{-3x}{-3} = \dfrac{-4}{-3}$
$x = \dfrac{4}{3}$

*To get rid of the fractions, mult. both sides by the LCD of 4

*Get all the x terms on one side

*Inverse of add. 2 is sub. 2

*Inverse of mult. by -3 is div. by -3

If you put $\frac{4}{3}$ back in for x in the original problem you will see that $\frac{4}{3}$ is the solution we are looking for.

Practice Problems 1 - 9: Solve for the variable.

These were done in class

1. 3a + 5 = 11
2. x - 3 = 7
3. 2(x + 5) = 16
4. 7x - 8 = 3x + 4
5. 4 (x - 1) = 2x-6
6. 4 (3x -1) - 3 (2x-6) = 11 (14-2x)
7. $\frac{x}{3} + \frac{2x}{4} = \frac{5}{3}$
8. $\frac{y}{8} + \frac{y}{10} = 9$

"Your grades _reflect_ your hard work!"

Need Extra Help on these Topics? See in the next class

Maths is FUN

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