6.2 Solving Equations using Algebra

Wednesday, January 27, 2016 1:35 PM

Unit 6: Linear Equations and Graphing Math 8

6.2 Solving Equations Using Algebra Notes

Name _____

When you use ***algebra*** to solve an equation, you always perform the same operation on both sides of the equation. That is, whatever you do to one side of an equation, you must do the same to the other side.

Ex.

Five more than three times a number is 23. What is the number?

let x represent the number

3 times the number → 3x

Five more → adding → 3x + 5

The equation → 3x + 5 = 23

Here are the steps to solve this equation:

Step 1: Isolate the variable by adding to or subtracting from **each side**.

In this case, to remove +5 from the left side, subtract 5 from each side.

*always do +/- first!!

$$3x + 5 = 23$$
$$-5 \quad -5$$
$$3x = 18$$

Step 2: Divide each side by the numerical coefficient.

* number in front of the letter.

In this case, divide each side by 3.

$$\frac{3x}{3} = \frac{18}{3}$$
$$x = 6$$

(check)

Step 3: Verify the solution by substitution.

Left side	Right side
$3x + 5$	23
$3(6) + 5$	↓
$18 + 5$	23 ✓
23 ✓	

$x = 6$

since RS = LS

$x = 6$ is correct.

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In some equations, such as $5x = 40$, you can omit Step 1 because the variable term is already isolated. In this case, start with Step 2 and divide each side by 5 to get $x = 8$.

$$\frac{5x}{5} = \frac{40}{5}$$

$$x = 8$$

Examples: Solve for x then verify. or n.

1. $8x - 7 = 9$

$+7 \quad +7$

$$\frac{8x}{8} = \frac{16}{8}$$

$$x = 2$$

check

LS	RS
$8x-7$	9
$8(2)-7$	
$16-7$	
9	9 ✓

2. $9 = 3n - 6$

$$9 = 3n - 6$$

$+6 \quad +6$

$$\frac{15}{3} = \frac{3n}{3}$$

$$n = 5$$

$$5 = n$$

} same.

3. $8 + 2n = 24$

$-8 \quad -8$

$$\frac{2n}{2} = \frac{16}{2}$$

$$n = 8$$

Assignment p.331 #5–11 use algebra no models.

course planning next week