

Lesson 2.3- SWBAT solve equations with variables on both sides.

Kickoff- Solve and check each of the following equations.

1)  $3(x+8) = 27$  Check  
 $3x+24=27$   
 $-24 -24$   
 $3x=3$   
 $\frac{3x}{3} = \frac{3}{3} x=1$   
 Check  $3(1)+24=27$  ✓

2)  $-3(2a-1) = 8$  Check  
 $-6a+3=8$   
 $-3-3$   
 $-6a=5$   
 $\frac{-6a}{-6} = \frac{5}{-6} a = -\frac{5}{6}$   
 Check  $-3(2(-\frac{5}{6})-1) = 8$   
 $8=8$

3)  $2(x-4) = 48$  Check  
 $2x-8=48$   
 $+8 +8$   
 $2x=56$   
 $\frac{2x}{2} = \frac{56}{2} x=28$

4)  $-4(-2x-1) = 20$  Check  
 $8x+4=20$   
 $-4 -4$   
 $8x=16$   
 $\frac{8x}{8} = \frac{16}{8} x=2$

Homework

1)  $c = -1$       4)  $p = -6$   
 2)  $k = -8/3$     5)  $v = -6$   
 3)  $a = 7$         6)  $x = 10$

**Steps to Solving Equations**

- Simplify both sides of the equal sign.
- Find inverse operation (addition/subtraction first)
- Perform the inverse operation.
- Draw a line and cross out what you can.
- Bring down everything else.
- Repeat!

Example:  $x+3 = -x+9$

$\frac{+x}{-x} \quad \frac{-x}{+x}$   
 $3x+3=9$   
 $-3 -3$   
 $\frac{3x}{3} = \frac{6}{3}$   
 $x=2$

Check  
 $x+3 = -x+9$   
 $(2)+3 = -(2)+9$   
 $5 = 5$  ✓

Examples: Solve each of the following and determine the type of solution.

1)  $3x-4 = x+10$   
 $\frac{-x}{-x} \quad \frac{+x}{+x}$   
 $2x-4=10$   
 $+4 +4$   
 $\frac{2x}{2} = \frac{14}{2}$   
 $x=7$   
 One solution ✓

2)  $2k+6 = 2k+6$   
 $\frac{-2k}{-2k} \quad \frac{+2k}{+2k}$   
 $6=6$   
 Many solutions

3)  $3k-4 = 3k+7$   
 $\frac{-3k}{-3k} \quad \frac{+3k}{+3k}$   
 $-4=7$   
 no solution

Directions: Solve and check (if possible) each of the following equations.

4)  $6r+7 = 13+7r$  Check  
 $\frac{-6r}{-6r} \quad \frac{-7r}{-7r}$   
 $7=13+r$   
 $-13 -13$   
 $-6=r$   
 Check  $6r+7=13+7r$   
 $6(-6)+7=13+7(-6)$   
 $-29=-29$

5)  $-7x-3x+2 = -8x-8$  Check  
 $\frac{-10x}{+10x} \quad \frac{+3x}{+10x}$   
 $2 = -8x-8$   
 $+8 +8$   
 $10 = -2x$   
 $\frac{10}{2} = \frac{-2x}{2}$   
 $5 = -x$   
 Check  
 $-7x-3x+2 = -8x-8$   
 $-7(5)-3(5)+2 = -8(5)-8$   
 $-48 = -48$  ✓

6)  $n-3n = 14-4n$  Check

7)  $5+2x = 2x+7$  Check

8)  $-10+x+4 = 7x-5$  Check

9)  $8x+16x-12 = 24x+16-4$  Check

10)  $-9x - 27 = 25 - 5x$       Check

11)  $6x - 5 = 2x + 14 + 3x$       Check

12)  $-3x - 26 = 5x + 26$       Check

13)  $-8 + 7x = 5x + 18$       Check

14)  $-25 + 2x + 3 = 21 + 5x + 20$       Check

15)  $4x + 5 = -10 + 4x + 15$       Check