

**FEBRUARY 18, 2016**

**UNIT 5: LINEAR EQUATIONS AND  
INEQUALITIES**

**SECTION 6.2:  
SOLVING EQUATIONS BY  
USING BALANCE  
STRATEGIES**

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*MATH 9*



## **WHAT'S THE POINT OF TODAY'S LESSON?**

**We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Patterns and Relations 3" OR "PR3" which states:**

**"Model and solve problems using linear equations in a variety of forms ( $ax = b$  ;  $ax + b = c$  ;  $ax + b = cx + d$  ;  $a(bx + c) = d(ex + f)$  etc.) concretely, pictorially and symbolically where a, b, c, d, e and f are rational numbers."**



**What does THAT mean???**

**SCO PR3 means ALGEBRA!!!**



**WARM UP - SOLVE AND VERIFY THE FOLLOWING EQUATION:**

2 4 6 (8) 10  
 4 (8) 12 16 20  
 (8) 16 24 32

$$\frac{1x}{2} - \frac{3}{4} = \frac{5}{8}$$

$$\frac{\overset{4}{\cancel{8}}}{\cancel{1}} \left( \frac{\overset{1}{\cancel{2}}}{\cancel{1}} x \right) - \frac{\overset{2}{\cancel{8}}}{\cancel{1}} \left( \frac{\overset{3}{\cancel{4}}}{\cancel{1}} \right) = \frac{\overset{1}{\cancel{8}}}{\cancel{1}} \left( \frac{\overset{5}{\cancel{8}}}{\cancel{1}} \right)$$

↓  
S A M D E B

$$4x - 6 = 5$$

$$4x - 6 + 6 = 5 + 6$$

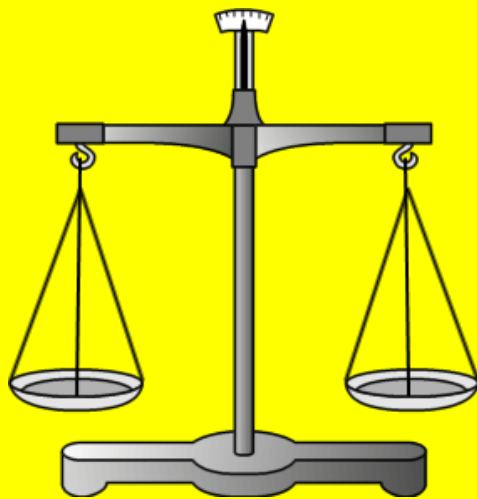
$$\frac{\cancel{4}x}{\cancel{4}} = \frac{11}{4}$$

$$x = \frac{11}{4}$$

LS	RS
$\frac{1}{2}x - \frac{3}{4}$ $\frac{1}{2} \left( \frac{11}{4} \right) - \frac{3}{4}$ $\frac{11}{8} - \frac{3}{4}$ $\frac{11}{8} - \frac{6}{8}$ $\frac{5}{8}$	$\frac{5}{8}$

$$LS = RS \therefore x = \frac{11}{4}$$

**ALGEBRA IS A "BALANCING ACT"...**



## **SIMPLIFYING PRIOR TO SOLVING EQUATIONS:**

**THERE ARE 3 SITUATIONS THAT MAY ARISE EITHER INDIVIDUALLY OR IN COMBINATION THAT YOU WILL HAVE TO DO PRIOR TO SOLVING SOME EQUATIONS (i.e. prior to working with SAMDEB):**

### **1. Grouping **LIKE TERMS**:**

- on one or both sides of an equation**
- like terms containing variables must end up on the same side of an equation**

## Grouping **LIKE TERMS** - Examples:

i.  $4x + 2x = 12$   
 $\frac{6x}{6} = \frac{12}{6}$   
 $x = 2$

ii.  $5y + 3 = 2y + 19 + y$   
*Simplifying*  $5y + 3 = 3y + 19$   
 $5y - 3y + 3 = \cancel{3y} - \cancel{3y} + 19$   
*Solving (same terms)*  $2y + 3 = 19$   
 $2y + 3 - 3 = 19 - 3$   
 $\frac{2y}{2} = \frac{16}{2}$   
 $y = 8$

## 2. Performing the **DISTRIBUTIVE PROPERTY**:

→ this is generally done prior to solving an equation (ie: prior to working with "SAMDEB")

→ Examples:

i.

$$4(m + 5) = 16$$
$$4m + 20 = 16$$
$$4m + 20 - 20 = 16 - 20$$
$$\frac{4m}{4} = \frac{-4}{4}$$
$$m = -1$$



## 2. Performing the **DISTRIBUTIVE PROPERTY**:

→ this is generally done prior to solving an equation (ie: prior to working with "SAMDEB")

→ Examples:

i.

$$\begin{aligned} & \cancel{4(m+5)} = \cancel{16} \\ & * m+5 = 4 \\ & m+5-5 = 4-5 \\ & * m = -1 \end{aligned}$$

ii.

$$3(p-1) = 5(p+7)$$

$$3p - 3 = 5p + 35$$

$$3p - 3p - 3 = 5p - 3p + 35$$

$$-3 = 2p + 35$$

$$-3 - 35 = 2p + 35 - 35$$

$$\frac{-38}{2} = \frac{2p}{2}$$

$$-19 = p$$

} Simplifying

و لا تنسى!

Verification ( $p = -19$ ):

LS	RS
$3(p - 1)$	$5(p + 7)$
$3(-19 - 1)$	$5(-19 + 7)$
$3(-20)$	$5(-12)$
$-60$	$-60$

$$LS = RS \therefore p = -19.$$

## **CONCEPT REINFORCEMENT:**

***MMS9:***

**Page 281: #10, #11 and #13**

**Remember to check your answers in the back of the book as part of your homework. The answers for these questions are on page 514.**