FEBRUARY 1, 2019

UNIT 5: LINEAR EQUATIONS AND INEQUALITIES

SECTION 6.1: SOLVING EQUATIONS BY USING INVERSE OPERATIONS

K.SEARS
MATH 9

WHAT'S THE POINT OF TODAY'S LESSON?

We will begin 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!!!

What's the difference between an expression and an equation?

EXPRESSION: 5x + 2
(Polynomial / Binomial)

EQUATION 5x + 2 = -8
(Algebra)

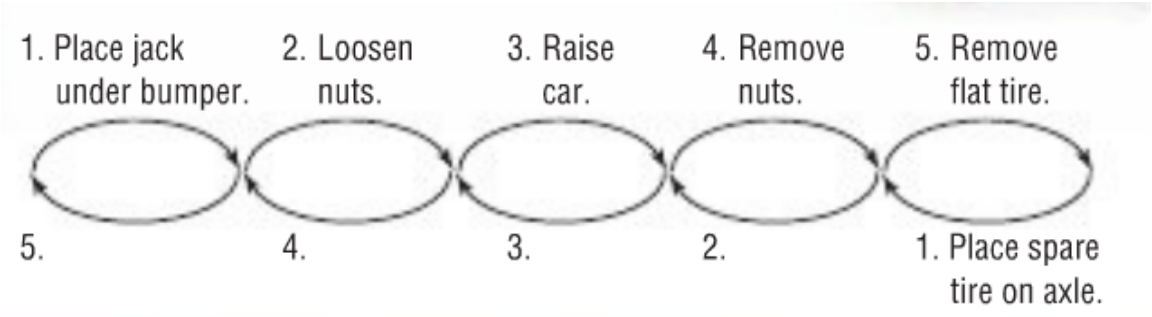
Please turn to page 264 in
***Math Makes Sense 9* (*MMS9*).**

"What You'll Learn"

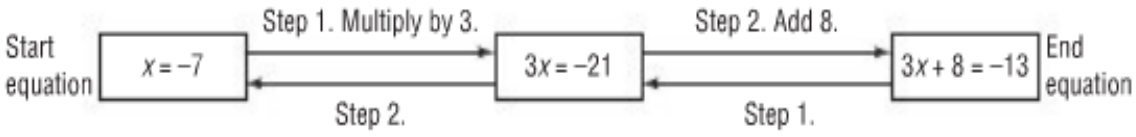
"Why It's Important"

And now for the nuts and bolts of it all...

The top row of the arrow diagram below shows the steps to remove a flat tire on a car. What steps are needed to put on a new tire?

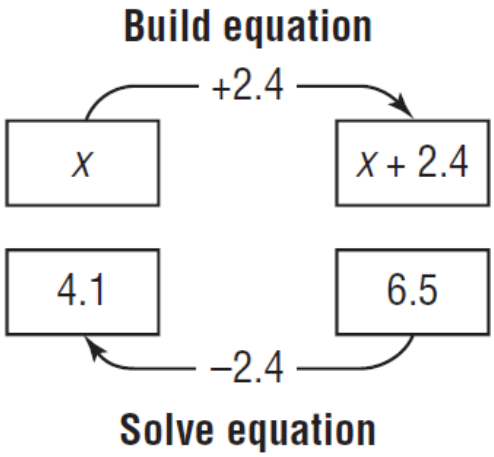


The arrow diagram used in the previous example is very much like algebra. The top row of the arrow diagram below shows the operations applied to the equation x = -7. What steps are needed to return to the original equation?

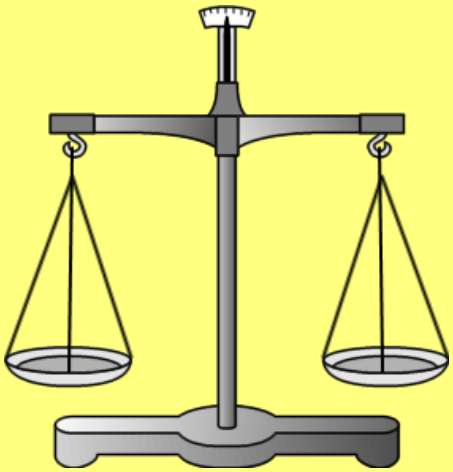


Another example...

To solve $x + 2.4 = 6.5$:



ALGEBRA IS A "BALANCING ACT"...



INVERSE PROPERTY:

This property occurs when a mathematical operation is "undone". For example, subtraction "undoes" addition and division "undoes" multiplication. Algebra is based on this property. We sometimes say that we use the "method of inverse operations" to solve algebraic equations.

EX.: $x + 4 = 10$ (−4 −4) $x = 6$

We need to isolate the "x" here to solve this equation, so we have to "undo" the addition next to the "x" by doing the opposite or inverse - a subtraction. Remember - what we do to one side of an equation, we MUST do to the other side as well!!!

$$x + 4 - 4 = 10 - 4$$

$$x = 6$$

EX.: $\frac{3x}{3} = \frac{12}{3}$ $x = 4$

We need to isolate the "x" here to solve this equation, so we have to "undo" the multiplication next to the "x" by doing the opposite or inverse - a division.

$$\frac{3x}{3} = \frac{12}{3}$$

$$x = 4$$

$x - 8 = -2$ (+8 +8) $x = 6$

$x + 5 = 10$ (−5 −5) $x = 5$

$x - 9 = -6$ (+9 +9) $x = 3$

$b + c = -2$ (−c −c) $b = -2 - c$

$\frac{-3x}{-3} = \frac{24}{-3}$ $x = -8$

Concept Reinforcement:

Work on worksheets