Warm Up   Solve the equation.

1. $2x + 7 = 15$

$$\frac{-7 \quad -7}{}$$

$$\frac{2x}{2} = \frac{8}{2}$$

$$x = 4$$

3. $3x - 7 + x = 5$

$$+7 \qquad +7$$

$$\frac{4x}{4} = \frac{12}{4}$$

$$x = 3$$

2. $30 = 16 + \frac{1}{5}x$

$$-16 \quad -16$$

$$14 = \frac{1}{5}x$$

$$\frac{1}{5} \qquad \frac{1}{5}$$

$$x = 70$$

4. $12(2 - x) = 6$

$$24 - 12x = 6$$

$$-24 \qquad +24$$

$$\frac{-12x}{-12} = \frac{-18}{-12}$$

$$x = \frac{3}{2}$$

Homework Questions?

On the top of your paper (by your name) rate yourself for this section:

4 - I can summarize the concepts and explain it to others

3 - I can apply the concept to answer questions correctly

2 - I can apply the concepts but with some mistakes

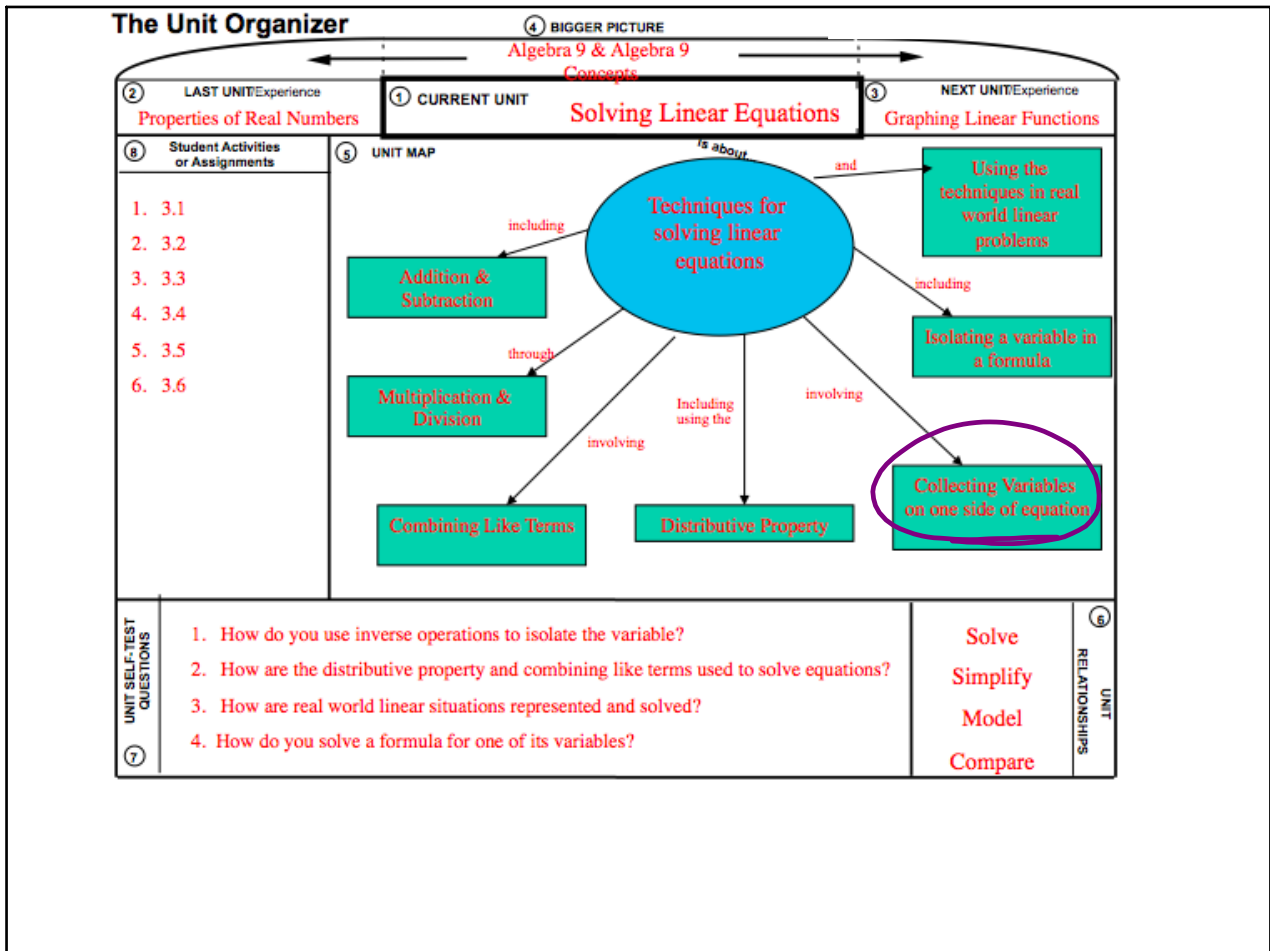**1 - I need help and know how to apply the concept**

0 - I can't apply the concept, even with help

Rating of 0-2 is a warning signal to me that you need help

3.4 Solving Equations with Variables on Both Sides

Goals: • Solve equations that have variables on both sides.

EQ: How do you get the variable onto one side?

The Unit Organizer

④ BIGGER PICTURE
Algebra 9 & Algebra 9 Concepts

② LAST UNIT/Experience
Properties of Real Numbers

① CURRENT UNIT
Solving Linear Equations

③ NEXT UNIT/Experience
Graphing Linear Functions

⑧ Student Activities or Assignments

1. 3.1
2. 3.2
3. 3.3
4. 3.4
5. 3.5
6. 3.6

⑤ UNIT MAP

is about

Techniques for solving linear equations

including

Addition & Subtraction

through

Multiplication & Division

involving

Combining Like Terms

Including using the

Distributive Property

involving

Collecting Variables on one side of equation

and

Using the techniques in real world linear problems

including

Isolating a variable in a formula

⑦ UNIT SELF-TEST QUESTIONS

1. How do you use inverse operations to isolate the variable?
2. How are the distributive property and combining like terms used to solve equations?
3. How are real world linear situations represented and solved?
4. How do you solve a formula for one of its variables?

⑥ UNIT RELATIONSHIPS

Solve

Simplify

Model

Compare

Example 1: Collect Variables on One Side

Solve $4x - 10 = 32 - 3x$

$+3x \qquad\qquad +3x$

$7x - 10 = 32$

$+10 \quad +10$

$\dfrac{7x}{7} = \dfrac{42}{7}$

$$x = 6$$

*Move smallest # variable

3

Example 2: Combine Like Terms First

Solve $2x - 9 + 7x = 4x - 34$

$$9x - 9 = 4x - 34$$
$$\underline{-4x \qquad\qquad -4x}$$
$$5x - 9 = -34$$
$$\underline{+9 \qquad +9}$$
$$\frac{5x}{5} = \frac{-25}{5}$$
$$\boxed{x = -5}$$

Try It   Solve the equation. Check your solution in the original equation.

1. $6x = 5x - 33$
$$\underline{-5x \quad -5x}$$
$$\frac{x}{1} = \frac{-33}{1}$$
$$\boxed{x = -33}$$

$6(-33) = 5(-33) - 33$
$-198 = -198$ ✓

2. $10p - 22 = -p$
$$\underline{-10p \qquad -10p}$$
$$\frac{-22}{-11} = \frac{-11p}{-11}$$
$$\boxed{2 = P}$$

$6(2) - 22 = 2$
$-2 = -2$

3. $8k - 22 = 10k$
$$\underline{-8k \qquad -8k}$$
$$\frac{-22}{2} = \frac{2k}{2}$$
$$\boxed{k = -11}$$

$8(-11) - 22 = 10(-11)$
$-110 = -110$ ✓

4. $2n - 4n = 3n + 17$
$$-2n = 3n + 17$$
$$\underline{-3n \qquad -3n}$$
$$\frac{-5n}{-5} = \frac{17}{-5}$$
$$n = \frac{-17}{5}$$

$2(\frac{-17}{5}) - 4(\frac{-17}{5}) = 3(\frac{-17}{5}) + 17$

Summary

EQ: How do you get the variable onto one side?

Add or subtract variable term to get on one side

* Easiest to move smallest #

Partner Wkst #1-11

*Put **your name** on the TOP and your **partner's name** on the BOTTOM

*When done, staple together and work on...

3.4 Homework Part 1

HW   p.154 #18-34even

Identify Number of Solutions

Solve the equation if possible. Determine whether it has *one solution*, *no solution*, or is an *identity*?

one solution: simplifies to x = #   ex: x = 1

no solution: variables cancel and get false statement
ex: 3 = 1

identity: variables cancel and get true statement
ex: 4 = 4

Example 3: Identify Number of Solutions

Solve the equation if possible. Determine whether it has *one solution, no solution,* or is an *identity.*

a. 2(4x + 5) = 8x + 10   b. x - 1 = x + 7

Try It   Solve the equation if possible. Determine whether the equation has *one solution, no solution,* or is an *identity.*

5. $3(x - 2) = 3x - 6$

6. $3(x - 2) = 3x + 1$

3.4 HW Continuted

p.154 #18-34even

and

p.155 #37-42