

## 1.3: Part 1 Notes 9/22

**Learning Target:** Solve Equations with Variables on Both Sides

To solve equations with variables on both sides, collect the **variable terms** on one side and the **constant terms** on the other.

$$\begin{array}{ccc} \text{Left} & & \text{Right} \\ 15 - 2x & = & -7x - 20 \end{array}$$

To solve equations with variables on both sides,  
collect the **variable terms** on one side  
and the **constant terms** on the other.

$$\begin{array}{ccc} \text{Left} & & \text{Right} \\ 15 - 2x & = & -7x - 20 \end{array}$$

Example 1:

Hint: Move the variable term that will lead to a positive value

$$\begin{array}{r} 15 - 2x = -7x - 20 \\ +2x \quad +2x \\ \hline \end{array}$$

collect the variables

$$\begin{array}{r} 15 = -5x - 20 \\ +20 \quad +20 \\ \hline \end{array}$$

collect the constants

$$\begin{array}{r} 35 = -5x \\ -5 \quad -5 \end{array}$$

$$\textcircled{-7 = x}$$



Example 2:

Using the **Distributive Property**

$$-2(x - 5) = 6(2 - 1/2x)$$

$$\begin{array}{r} -2x + 10 = 12 - 3x \\ +3x \qquad \qquad +3x \end{array}$$

**distributive property**

**collect the variables**

$$\begin{array}{r} \hline x + 10 = 12 \\ -10 \quad -10 \\ \hline \end{array}$$

**collect the constants**

$$\boxed{x = 2}$$



### On Your Own

Solve each equation in your notes

$$\begin{array}{r} 1. \quad -5x = 2x + 42 \\ \quad -2x \quad -2x \\ \hline \quad -7x = 42 \\ \quad \frac{-7x}{-7} = \frac{42}{-7} \quad x = -6 \end{array}$$

$$\begin{array}{r} 3. \quad 6(4-m) = 2m \\ \quad 24 - 6m = 2m \\ \quad \quad \quad +6m \quad +6m \\ \hline \quad 24 = 8m \\ \quad \frac{24}{8} = \frac{8m}{8} \\ \quad 3 = m \end{array}$$

$$\begin{array}{r} 2. \quad \frac{2.5y}{-2.5y} + 13 = \frac{4.5y}{-2.5y} - 1 \\ \hline \quad 13 = 2y - 1 \\ \quad \quad \quad +1 \quad \quad +1 \\ \hline \quad \frac{14}{2} = \frac{2y}{2} \\ \quad 7 = y \end{array}$$

## Special Distributive Property Cases

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$$5 - 1(2x + 4)$$

$$5 - 2x - 4$$

$$8 - 1(3m - 6)$$

$$8 - 3m + 6$$

## 1.3: Part 2 Notes 9/16

**Learning Target:** Solve Equations  
with Variables on Both Sides

# Special Cases And Applications

## Special Distributive Property Cases

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$$-1(-6x + 4)$$

$$6x - 4$$

$$9 - 1(7m - 6)$$

$$9 - 7m + 6$$

$$7 - 3(-2w - 5) + 10w$$

$$7 + 6w + 15 + 10w$$



# Special Solutions!

Equations with **NO** Solutions

Equations with  
**Infinitely Many Solutions**

$\infty$  Solutions

Example 1:

$$\begin{array}{r} 3 - 4x = -7 - 4x \\ + 4x \quad + 4x \\ \hline 3 \neq -7 \end{array}$$

No Solution

$$\begin{array}{r} 3 - 4x = -7 - 4x \\ -3 \quad -3 \\ \hline -4x = -10 - 4x \\ + 4x \quad + 4x \\ \hline 0 \neq -10 \end{array}$$

Example 2:

$$6x + 4 = 4(1.5x + 1)$$

$$\begin{array}{r} 6x + 4 = 6x + 4 \\ -6x \quad -6x \\ \hline 4 = 4 \end{array}$$

Infinite Solutions  
 $\infty$  Solutions



### On Your Own

Solve each equation in your notes

$$\begin{array}{r} 2x+1 = 2x -1 \\ -2x \quad -2x \\ \hline 1 \neq -1 \end{array}$$

No Solution

$$6(5 - 2y) = 4(3y + 1.5)$$

$$30 - 12y = 12y + 6$$

$$+12y + 12y$$

$$\hline 30 = 24y + 6$$

$$-6 \quad -6$$

$$\hline 24 = 24y$$

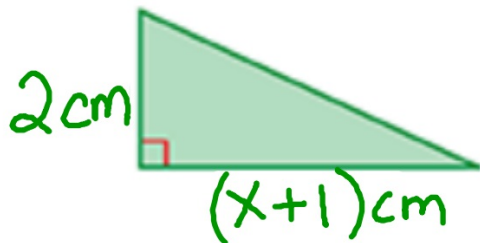
$$y = 1$$

$$\frac{1}{2}(6w - 4) = 3w - 2$$

$$3w - 2 = 3w - 2$$

$\infty$  Solutions

**GEOMETRY** Are there any values of  $x$  for which the areas of the figures are the same? Explain.



$$A = b \cdot h$$

$$A = \frac{1}{2} (b \cdot h)$$

$$A = \frac{b \cdot h}{2}$$

$$\frac{2(x+1)}{2} = x$$

$$\begin{array}{r} x + 1 = x \\ -x \quad \quad -x \\ \hline 1 = 0 \end{array}$$

**NO solution**

There are no values of  $x$  that will make the areas the same

A polygon is regular if each of its sides have the same length.

Find the perimeter of the polygon.

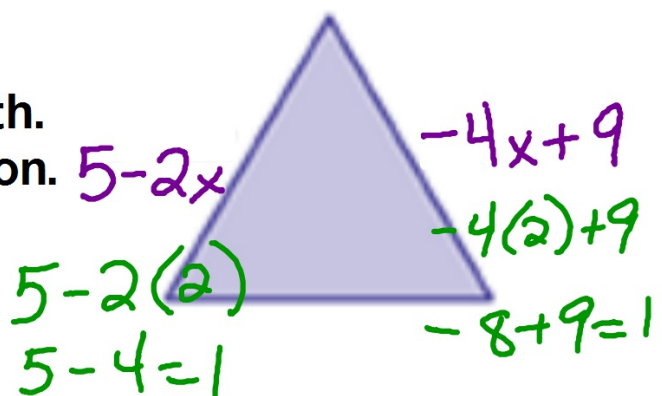
$$\begin{array}{r}
 5 - 2x = -4x + 9 \\
 +4x \quad +4x \\
 \hline
 5 + 2x = 9 \\
 -5 \quad -5 \\
 \hline
 2x = 4 \\
 x = 2
 \end{array}$$

Now Pick a side

$$5 - 2x$$

$$5 - 2(2) = 5 - 4$$

each side = 1 unit



So if each side equals 1,

**Perimeter = 3 units**

# **Homework**

**Pg 23-24**

**# 1, 2, 13-29 odd,  
30-42 even**

