1.3: Part 1 Notes 9/18

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.

Left		Right
$15 - 2x$	$=$	$-7x - 20$

Remember our equations with pi

$x + 2\pi = 7\pi$

$-2\pi \quad -2\pi$

$x = 5\pi$

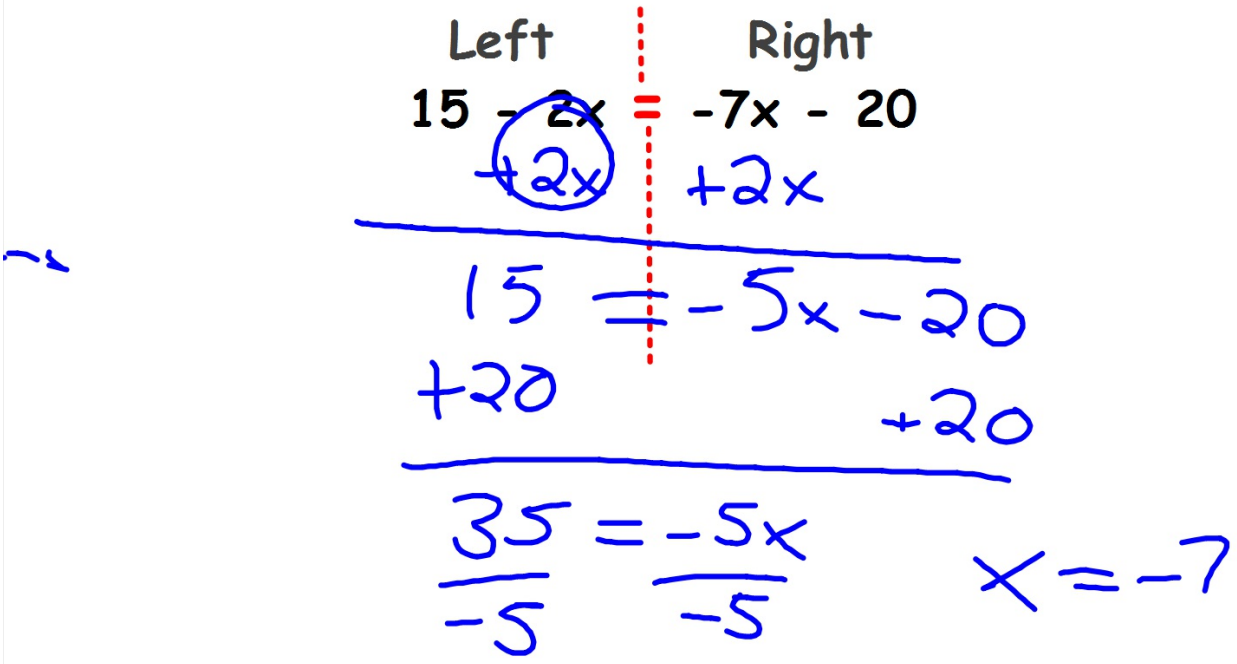
$-8\pi = 9\pi + w$

$-9\pi \quad -9\pi$

$-17\pi = w$

$x + 2n = 7n$

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



Example 1:

$15 - 2x = -7x - 20$

$+7x \quad +7x$

$15 + 5x = -20$

$-15 \quad -15$

$\frac{5x}{5} = \frac{-35}{5}$

$x = -7$

collect the variables

collect the constants

Example 2:
Using the Distributive Property

$$-2(x-5) = 6\left(2-\tfrac{1}{2}x\right)$$

$-2x+10 = 12-3x$
$+3x \qquad +3x$

$x+10=12$
$-10 \quad -10$

$-2x+10=12-3x$ distributive property
$+2x \qquad +2x$ collect the variables

$10=12-1x$
$-12 \quad -12$

collect the constants

$\frac{-2}{-1} = \frac{-1x}{-1}$

$x=2$

On Your Own

Solve each equation

1. $-5x = 2x + 42$

-6

2. $2.5y + 13 = 4.5y - 1$

7

$-2.5y \quad -2.5y$

$13 = 2y - 1$

$+1 \qquad +1$

$\frac{14}{2} = \frac{2y}{2}$

3. $6(4-m) = 2m$

3

$24 - 6m = 2m$

$+6m \quad +6m$

$\frac{24}{8} = \frac{8m}{8}$

Special Distributive Property Cases

$5 - 1(2x + 4)$

$5 - 2x - 4$

$1 - 2x$

$8 - (3m - 6)$

$8 - 3m + 6$

$15 - 3m$

1.3: Part 2

Learning Target: Solve Equations with Variables on Both Sides

Special Cases And Applications

More Special Distributive Property Cases

$5 - 3(2x + 4)$

$5 - 6x - 12$

$-7 - 6x$

$4 - (2m - 3) + 6m$

$4 - 2m + 3 + 6m$

$4m + 7$

Special Solutions!

Equations with NO Solutions
Equations with Infinitely Many Solutions

Example 3:

$3 - 4x = -7 - 4x$

$+4x \qquad +4x$

$3 \neq -7$

No Solution

Example 4: Infinitely Many Solutions

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

$6x + 4 = 6x + 4$

$-6x \quad -6x$

$4 = 4$

Left & right sides are identical

∞ Solutions ✓

On Your Own

Solve each equation

1. $2x+1 = 2x - 1$

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

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

On Your Own

Solve each equation

1. $2x+1 = 2x - 1$

$-2x \quad -2x$

$1 \neq -1$

No Solution

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

$30 - 12y = 12y + 6$

$+12y \quad +12y$

$30 = 24y + 6$

$-6 \qquad -6$

$\frac{24}{24} = \frac{24y}{24}$

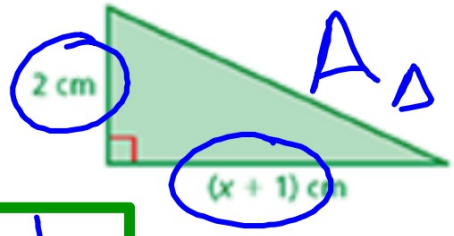
$1 = y$

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

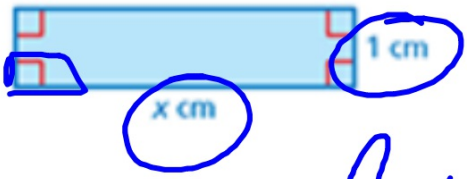
$3w - 2 = 3w - 2$

∞ Solutions

Are there any values of x for which the areas of the figures are the same?



A_Δ $= A$



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

$l \cdot w$

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

No Solution

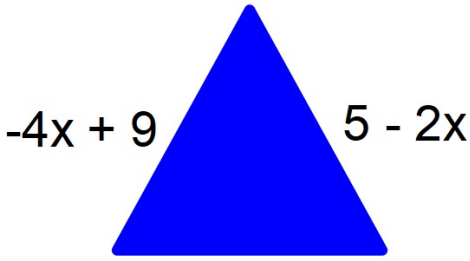
$\frac{2(x+1)}{2} = x$

$x + 1 = x$

$-x \quad -x$

$1 \neq 0$

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



$$5 - 2x = -4x + 9$$
$$+4x \quad +4x$$
$$5 + 2x = 9$$
$$-5 \quad -5$$
$$2x = 4$$
$$x = 2$$

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