

Solving Equations w/Variables on Both Sides

Prerequisite Skills Needed:

- Order of Operations
- Add/Subtract & Multiply/Divide Positive & Negative Integers
- Combining Like Terms

Previous Video:

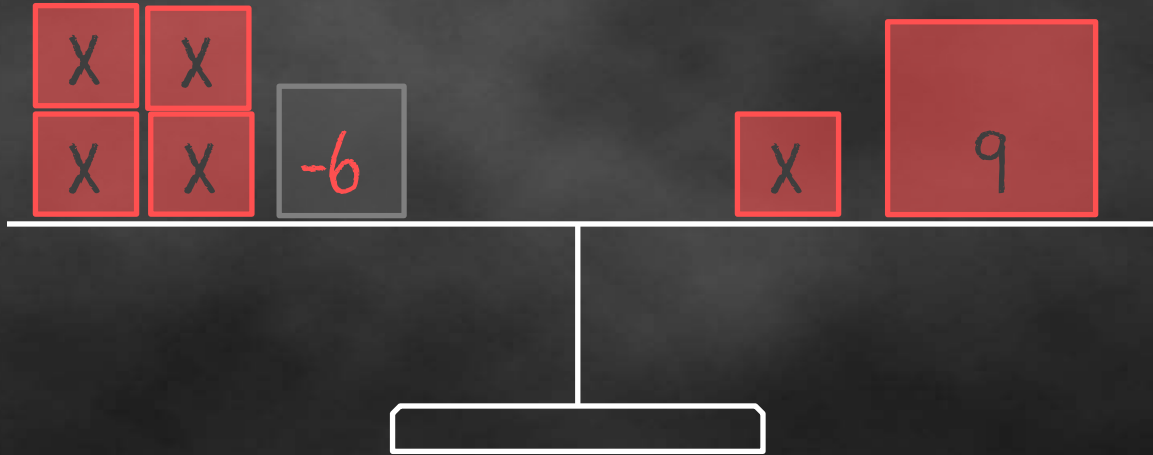
One Step & Two Step Equations

Solving Equations w/ Variables on Both Sides

Equations with variables on BOTH sides often confuse students, but it is no more complicated than solving other equations. REMEMBER:

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

$$4x - 6 = x + 9$$



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$$\begin{aligned} 4x - 6 &= x + 9 \\ -x & \leftarrow \quad = -x \end{aligned}$$

$$\begin{aligned} x &= 1x \\ -x &= -1x \end{aligned}$$



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$$\begin{aligned} 4x - 6 &= x + 9 \\ -1x &= -x \\ 3x - 6 &= 9 \end{aligned}$$



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$$\begin{aligned} 4x - 6 &= x + 9 \\ -1x &= -x \\ 3x - 6 &= 9 \\ +6 &= +6 \end{aligned}$$



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$$4x - 6 = x + 9$$

$$-1x \quad = \quad -x$$

$$3x - 6 = 9$$

$$+ 6 = + 6$$

$$3x = 15$$

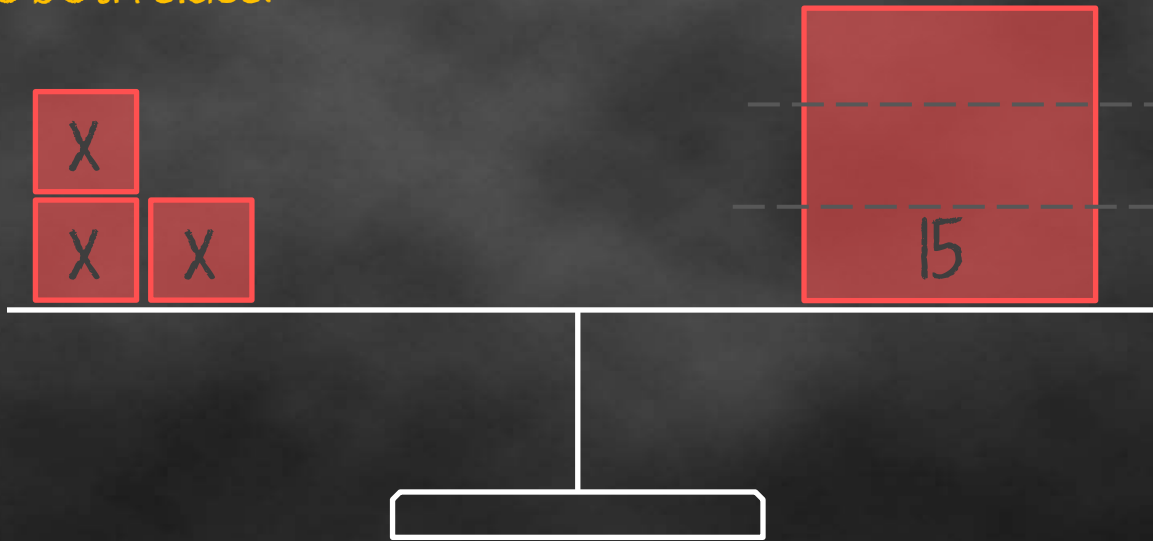


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$$\begin{aligned} 4x - 6 &= x + 9 \\ -1x &= -x \\ 3x - 6 &= 9 \\ +6 &= +6 \\ \frac{3x}{3} &= \frac{15}{3} \end{aligned}$$



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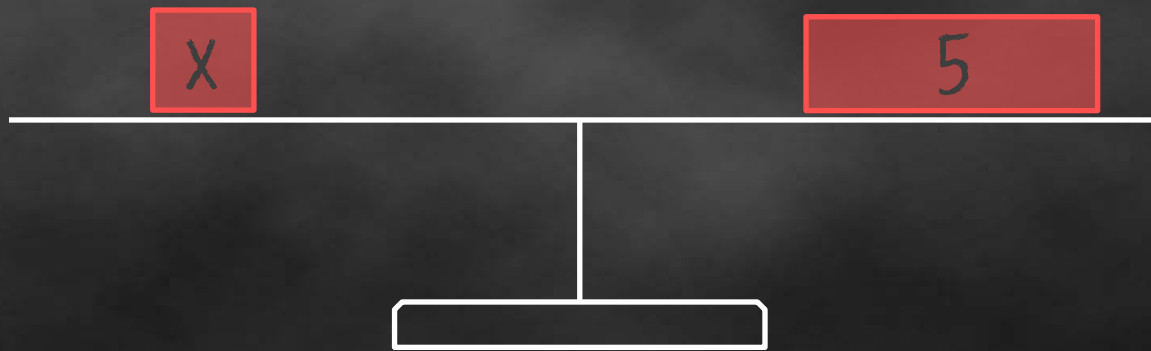
$$4x - 6 = x + 9$$

$$\begin{array}{r} -1x \\ \hline 3x - 6 = 9 \end{array}$$

$$\begin{array}{r} +6 \\ \hline 3x = 15 \end{array}$$

$$\begin{array}{r} \frac{3x}{3} = \frac{15}{3} \\ \hline x = 5 \end{array}$$

$$x = 5$$



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As these equations get more involved, it would be too cumbersome to continue representing on the balance scale - you need to PRACTICE and MASTER algebraic problem solving!!

$$3(x + 2) = -5 - 2(x - 3)$$



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$$\begin{aligned} 3(x + 2) &= -5 - 2(x - 3) \\ 3x + 6 &= -5 \end{aligned}$$

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$$\widehat{3(x+2)} = -5 - \widehat{2(x-3)}$$
$$3x + 6 = -5 - 2x$$

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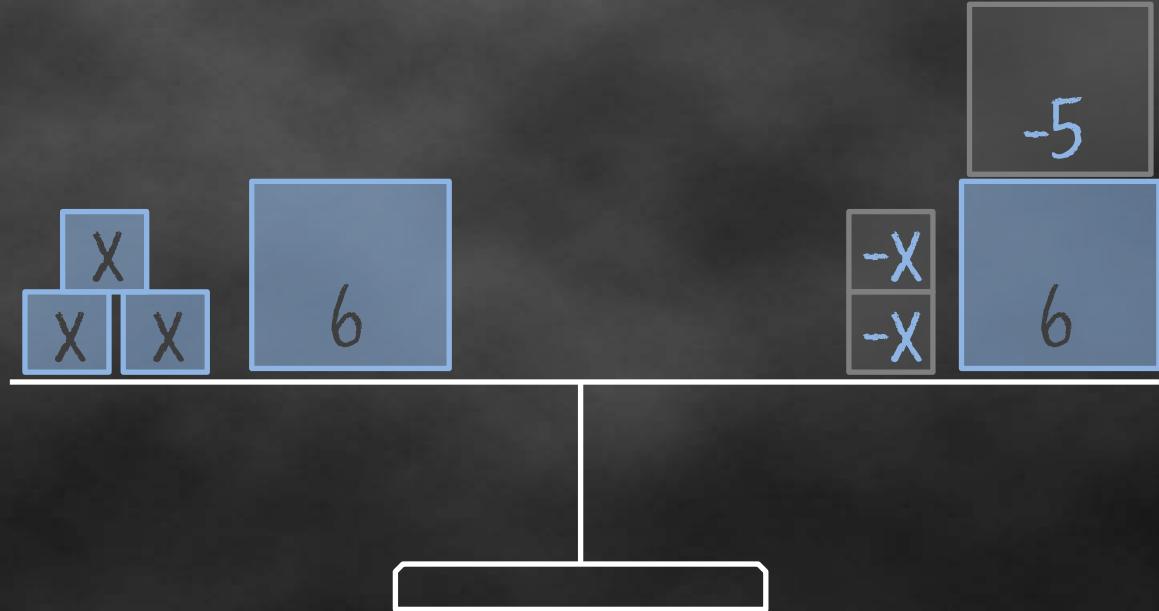
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$$\begin{aligned} 3(x + 2) &= -5 - 2(x - 3) \\ 3x + 6 &= -5 - 2x + 6 \\ &= -2x + 6 - 5 \end{aligned}$$

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$$\begin{aligned} 3(x + 2) &= -5 - 2(x - 3) \\ 3x + 6 &= -5 - 2x + 6 \\ &= -2x + 6 - 5 \\ &\quad + 1 \end{aligned}$$

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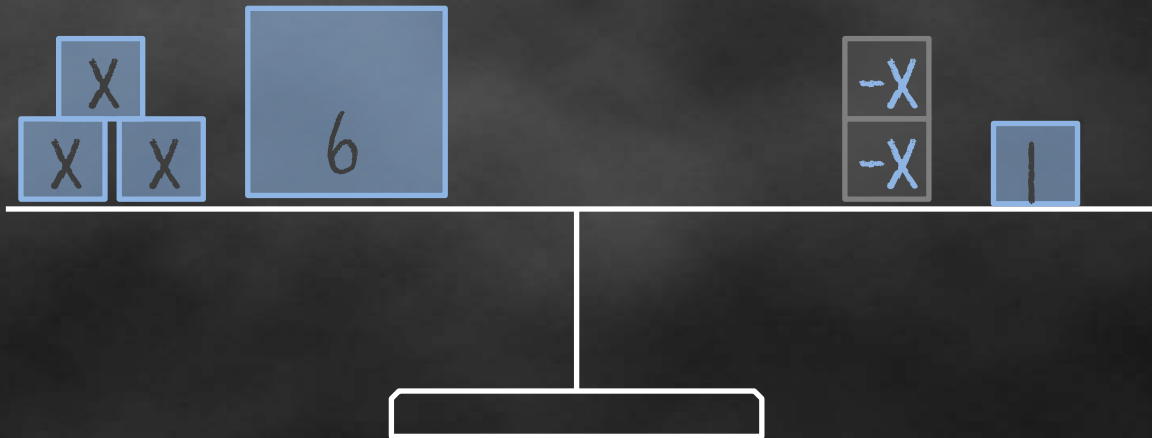
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$$\begin{aligned} 3(x+2) &= -5 - 2(x-3) \\ 3x + 6 &= -5 - 2x + 6 \\ &= -2x + 6 - 5 \\ 3x + 6 &= -2x + 1 \\ +2x &= +2x \end{aligned}$$

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$$3(x + 2) = -5 - 2(x - 3)$$

$$3x + 6 = -5 - 2x + 6$$

$$= -2x + 6 - 5$$

$$3x + 6 = -2x + 1$$

$$+2x \quad = +2x$$

$$5x + 6 = \quad + 1$$

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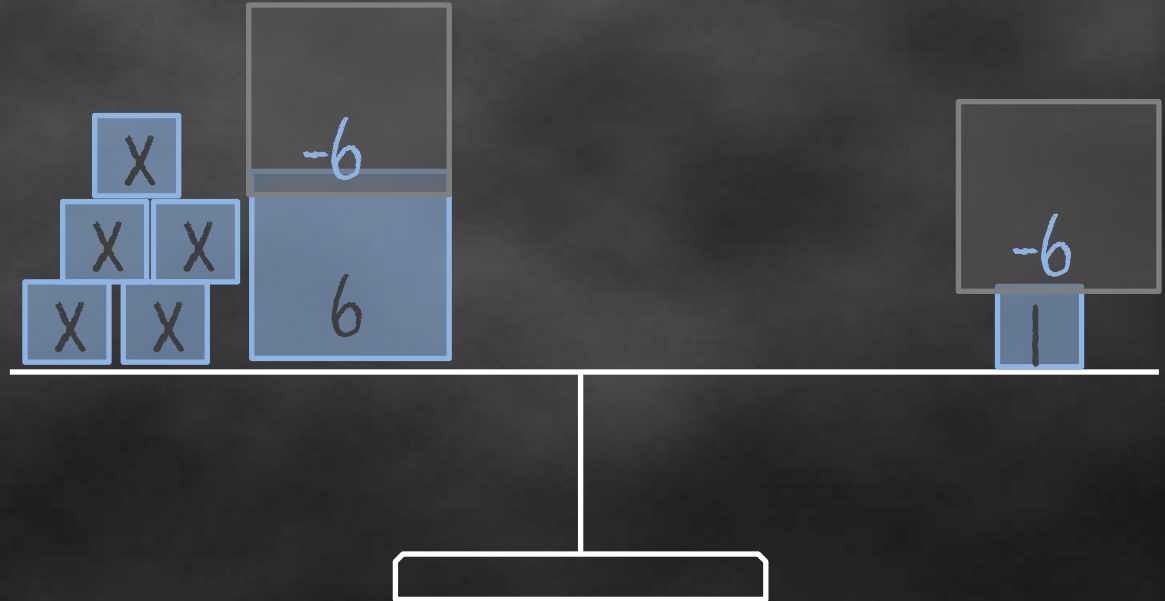
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$$\begin{aligned}
 \overbrace{3(x+2)} &= -5 - \overbrace{2(x-3)} \\
 3x + 6 &= -5 - 2x + 6 \\
 &= -2x + 6 - 5 \\
 3x + 6 &= -2x + 1 \\
 +2x &= +2x \\
 5x + 6 &= 1 \\
 -6 &= -6
 \end{aligned}$$



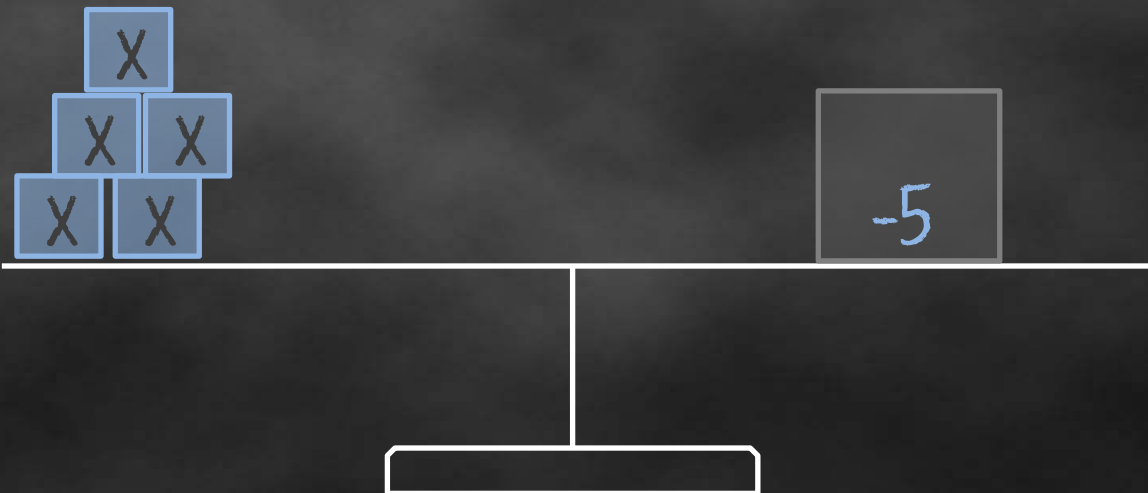
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$$\begin{aligned}
 3(x + 2) &= -5 - 2(x - 3) \\
 3x + 6 &= -5 - 2x + 6 \\
 &= -2x + 6 - 5 \\
 3x + 6 &= -2x + 1 \\
 +2x &= +2x \\
 5x + 6 &= 1 \\
 -6 &= -6 \\
 5x &= -5
 \end{aligned}$$



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$$3(x + 2) = -5 - 2(x - 3)$$

$$3x + 6 = -5 - 2x + 6$$

$$= -2x + 6 - 5$$

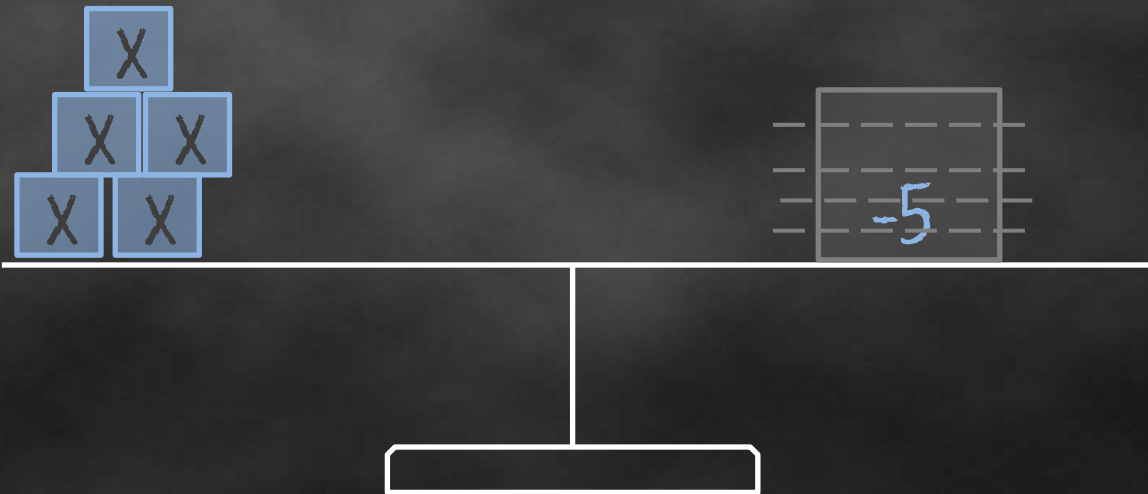
$$3x + 6 = -2x + 1$$

$$+2x \quad = +2x$$

$$5x + 6 = 1$$

$$-6 \quad = -6$$

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



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$$3(x + 2) = -5 - 2(x - 3)$$

$$3x + 6 = -5 - 2x + 6$$

$$= -2x + 6 - 5$$

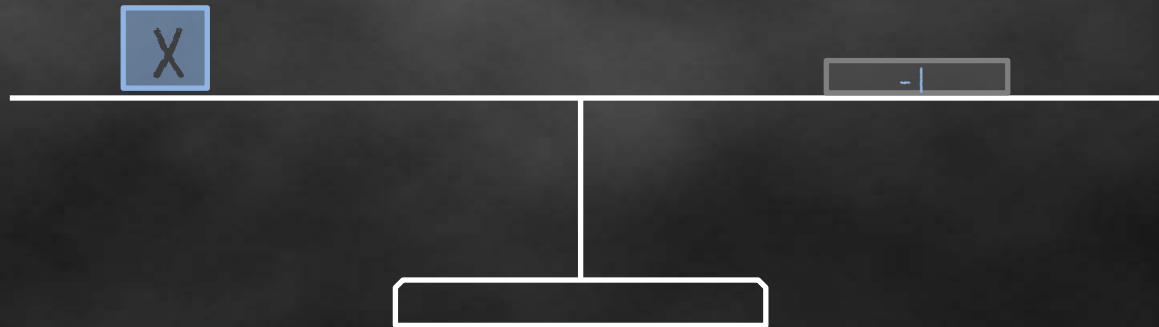
$$3x + 6 = -2x + 1$$

$$+2x \quad = +2x$$

$$5x + 6 = 1$$

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



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$$3(x + 2) = -5 - 2(x - 3)$$

$$3x + 6 = -5 - 2x + 6$$

$$= -2x + 6 - 5$$

$$3x + 6 = -2x + 1$$

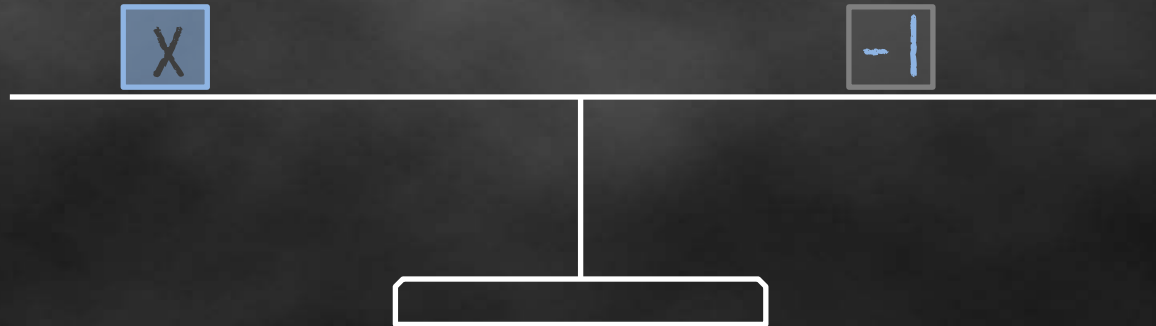
$$+2x \quad = +2x$$

$$5x + 6 = 1$$

$$-6 \quad = -6$$

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

$$x = -1$$



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Here are some more examples - this time without the use of the balance scale.

- 1) Seek to Isolate the variable TO ONE SIDE.
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$$-1(y + 7) = -6y + 8$$

If you are consistently getting incorrect answers, please see my Common Mistakes When Solving Equations video.

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- 1) Seek to Isolate the variable TO ONE SIDE.
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$$\begin{aligned} -1(y + 7) &= -6y + 8 \\ -y - 7 &= -6y + 8 \end{aligned}$$

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$$\begin{aligned} -1(y + 7) &= -6y + 8 \\ -y - 7 &= -6y + 8 \\ +6y &= +6y \end{aligned}$$

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- 1) Seek to Isolate the variable TO ONE SIDE.
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$$-(y + 7) = -6y + 8$$

$$-y - 7 = -6y + 8$$

$$+6y \quad = +6y$$

$$5y - 7 = 8$$

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$$-(y + 7) = -6y + 8$$

$$-y - 7 = -6y + 8$$

$$+6y \quad = +6y$$

$$5y - 7 = 8$$

$$+7 = +7$$

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$$+6y \quad = +6y$$

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$$+7 \quad = +7$$

$$5y = 15$$

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$$-1(y + 7) = -6y + 8$$

$$-y - 7 = -6y + 8$$

$$+6y = +6y$$

$$5y - 7 = 8$$

$$+7 = +7$$

$$\frac{5y}{5} = \frac{15}{5}$$

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$$-y - 7 = -6y + 8$$

$$+6y \quad = +6y$$

$$5y - 7 = 8$$

$$+7 = +7$$

$$\frac{5y}{5} = \frac{15}{5}$$

$$y = 3$$

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- 1) Seek to Isolate the variable TO ONE SIDE.
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$$\begin{aligned} -(-6) &= -6 + 6 \\ -7 &= -7 + 6 \\ +6y &= 6x - 6 \\ 5y &= 6x - 1 \\ +1 &= +1 \\ \frac{5y}{5} &= \frac{15}{5} \end{aligned}$$

$$y = 3$$

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$$\frac{2(2a+1)}{3} = 3(a-2)$$

Solving Equations w/ Variables on Both Sides

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$$\frac{3}{1} \cdot \frac{2(2a+1)}{3} = 3(a-2) \cdot \frac{3}{1}$$

$$\begin{aligned} -(-6) &= -6 + 6 \\ -7 &= -7 + 6 \\ +6y &= 6x - 6 \\ \frac{5y}{5} &= \frac{6x-6}{5} \\ \frac{5y}{5} &= \frac{15}{5} \end{aligned}$$

$$y = 3$$

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$$\begin{aligned} -(-6) &= -6 + 6 \\ -7 &= -7 + 6 \\ +6y &= -6x + 6 \\ 5y &= -6x + 6 + 1 \\ 5y &= -6x + 7 \\ \frac{5y}{5} &= \frac{-6x + 7}{5} \\ y &= \frac{-6x + 7}{5} \end{aligned}$$

$$y = 3$$

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$$\begin{aligned} \cancel{\frac{3}{1}} \cdot \frac{2(2a+1)}{\cancel{3}} &= 3(a-2) \cdot \frac{3}{1} \\ 2(2a+1) &= 9(a-2) \end{aligned}$$

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$$\begin{aligned} -(-6) &= -6 + 6 \\ -7 &= -7 + 6 \\ +6y &= 6x - 2 \\ 5y &= 6x - 2 + 1 \\ +1 &= +1 \\ \frac{5y}{5} &= \frac{15}{5} \end{aligned}$$

$$y = 3$$

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$$\begin{aligned} \cancel{\frac{3}{1} \cdot \frac{2(2a+1)}{3}} &= 3(a-2) \cdot \cancel{\frac{3}{1}} \\ 2(2a+1) &= 9(a-2) \\ 4a + 2 &= 9a - 18 \end{aligned}$$

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$$y = 3$$

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$$\begin{aligned} \cancel{\frac{3}{1} \cdot \frac{2(2a+1)}{3}} &= 3(a-2) \cdot \cancel{\frac{3}{1}} \\ 2(2a+1) &= 9(a-2) \\ 4a + 2 &= 9a - 18 \\ +18 &= +18 \end{aligned}$$

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~~$$\begin{aligned} -(-6) &= -6 + 6 \\ -7 &= -7 + 6 \\ +6y &= -6x + 2 \\ 5y &= -6x + 2 + 1 \\ 5y &= -6x + 3 \\ \frac{5y}{5} &= \frac{-6x + 3}{5} \end{aligned}$$~~

$$y = 3$$

~~$$\frac{3}{1} \cdot \frac{2(2a+1)}{3} = 3(a-2) \cdot \frac{3}{1}$$~~

$$2(2a+1) = 9(a-2)$$

$$4a + 2 = 9a - 18$$

$$+18 = +18$$

$$4a + 20 = 9a$$

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~~$$-(x - 1) = -6 + 2$$
$$-x + 1 = -4$$
$$-x = -5$$
$$+x \quad +x$$
$$0 = -5 + x$$
$$5 = x$$~~

$$y = 3$$

~~$$\frac{3}{1} \cdot \frac{2(2a+1)}{3} = 3(a-2) \cdot \frac{3}{1}$$~~

$$2(2a+1) = 9(a-2)$$
$$4a + 2 = 9a - 18$$
$$+18 = +18$$
$$4a + 20 = 9a$$
$$-4a = -4a$$

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~~$$-(x-1) = -6 + 2$$
$$-x + 1 = -4$$
$$-x = -4 - 1$$
$$-x = -5$$
$$+x \quad +x$$
$$5x = -5$$
$$\frac{5x}{5} = \frac{-5}{5}$$
$$x = -1$$~~

$$y = 3$$

~~$$\frac{3}{1} \cdot \frac{2(2a+1)}{3} = 3(a-2) \cdot \frac{3}{1}$$
$$2(2a+1) = 9(a-2)$$
$$4a + 2 = 9a - 18$$
$$+18 = +18$$
$$4a + 20 = 9a$$
$$\cancel{-4a} = \cancel{-4a}$$
$$20 = 5a$$~~

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$$\begin{aligned}
 -(x-1) &= -6 + 5 \\
 -x + 1 &= -1 \\
 -x &= -2 \\
 +x &= +x \\
 0 &= -2 + 2 \\
 0 &= 0
 \end{aligned}$$

$$\frac{5y}{5} = \frac{15}{5}$$

$$y = 3$$

$$\begin{aligned}
 \cancel{\frac{3}{1}} \cdot \frac{2(2a+1)}{\cancel{3}} &= 3(a-2) \cdot \frac{3}{1} \\
 2(2a+1) &= 9(a-2) \\
 4a + 2 &= 9a - 18 \\
 +18 &= +18 \\
 4a + 20 &= 9a \\
 \cancel{-4a} &= \cancel{-4a} \\
 \frac{20}{5} &= \frac{5a}{5}
 \end{aligned}$$

Solving Equations w/ Variables on Both Sides

Here are some more examples - this time without the use of the balance scale.

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

If you are consistently getting incorrect answers, please see my [Common Mistakes When Solving Equations](#) video.

$$\cancel{\frac{3}{1} \cdot \frac{2(2a+1)}{3}} = 3(a-2) \cdot \cancel{\frac{3}{1}}$$

$$2(2a+1) = 9(a-2)$$

$$4a + 2 = 9a - 18$$

$$+18 = \quad +18$$

$$4a + 20 = 9a$$

$$\cancel{-4a} = \cancel{-4a}$$

$$\frac{20}{5} = \frac{5a}{5}$$

$$\boxed{4 = a}$$

$$-() - 1 = -6 +$$

$$-7 =$$

$$+6y = 6x + 2$$

$$5y = 5x + 1$$

$$\frac{5y}{5} = \frac{5x+1}{5}$$

$$\boxed{y = 3}$$

Solving Equations w/ Variables on Both Sides

Here are some more examples - this time without the use of the balance scale.

Be sure to practice, practice, practice solving equations before moving on to the next video!

NOW WHAT?

- 1) Re-watch/Re-wind
- 2) Master Practice Problems
- 3) Next Skill: Solutions and Checking Your Work

Solving Equations w/ Variables on Both Sides

Here are some more examples - this time without the use of the balance scale.

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

$$\begin{aligned} -(-6) &= -6 + 6 \\ -7 &= -7 + 6 \\ +6y &= 0x + 2 \\ 5y &= 0 + 1 \\ +1 &= +1 \\ \frac{5y}{5} &= \frac{15}{5} \end{aligned}$$

$$\boxed{y = 3}$$

If you are consistently getting incorrect answers, please see my Solving Equations Common Mistakes video.

$$\begin{aligned} \cancel{\frac{3}{1}} \cdot \frac{2(2a+1)}{3} &= 3(a-2) \\ 2(2a+1) &= 3(a-2) \\ 4a+2 &= 3a-6 \\ +6 &= +6 \\ 4a+8 &= 3a-6 \\ -3a &= -3a \\ a+8 &= -6 \\ -8 &= -8 \\ a &= -14 \end{aligned}$$

$$\boxed{4 = a}$$

One Step & Two Step Equations

Even in a One Step or More Equation, you follow the same overall process:
1) Seek to Isolate the variable.

Be sure to practice, practice,
practice solving equations
before moving on to the
next video!

NOW WHAT?

- 1) Re-watch/Re-wind
- 2) Master Practice Problems
- 3) Next Skill: Equations w/
Variables on Both Sides

Solving Equations w/ Variables on Both Sides

Here are some more examples - this time without the use of the balance scale.

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

If you are consistently getting incorrect answers, please see my Solving Equations Common Mistakes video.

$$-10 + 7 = 6y + 8$$

$$-5y - 7 = -6y + 8$$

$$+6y \quad +6y$$

$$5y - 7 = 15$$

$$+7 \quad +7$$

$$\frac{5y}{5} = \frac{15}{5}$$

$$y = 5$$

$$y = 5$$

$$\frac{x + 10}{2} = 3$$

$$\cancel{2} \cdot \frac{(x + 10)}{\cancel{2}} = 3 \cdot \frac{2}{1}$$

$$x + 10 = 6$$

$$-10 = -10$$

$$x = -4$$

Solving Equations w/ Variables on Both Sides

Here are some more examples - this time without the use of the balance scale.

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

$$-10 + 7 = -6y + 8$$

$$-5y - 7 = -6y + 8$$

$$+6y \quad +6y$$

$$5y - 7 = 15$$

$$+7 \quad +7$$

$$\frac{5y}{5} = \frac{15}{5}$$

$$y = 5$$

$$\frac{x+10}{2} = 3$$

$$\frac{(x+10) \cdot 2}{2} = \frac{3 \cdot 2}{2}$$

$$x+10 = 6$$

$$-10 = -10$$

$$x = -4$$

If you are consistently getting incorrect answers, please see my Solving Equations Common Mistakes video.

$$\frac{3}{1} \cdot \frac{2(2a+1)}{3} = 3(a-2) \cdot \frac{3}{1}$$

$$2(2a+1) = 9(a-2)$$

$$4a + 2 = 9a - 18$$

$$+18 = +18$$

$$4a + 20 = 9a$$

$$-4a = -4a$$

$$\frac{20}{5} = \frac{5a}{5}$$

$$4 = a$$

Solving Equations w/ Variables on Both Sides

Here are some more examples - this time without the use of the balance scale.

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

$$\begin{array}{r}
 -10 + 7 = 6y + 8 \\
 -7 = 6y + 8 \\
 +6y \quad +6y \\
 5y - 7 = 15 \\
 +7 \quad +7 \\
 5y = 22 \\
 \frac{5y}{5} = \frac{22}{5} \\
 y = \frac{22}{5}
 \end{array}$$

$$y = 5$$

$$\begin{array}{r}
 \frac{x+10}{2} = 3 \\
 \frac{2}{1} \cdot \frac{(x+10)}{2} = 3 \cdot \frac{2}{1} \\
 x+10 = 6 \\
 -10 = -10 \\
 \boxed{x = -4}
 \end{array}$$

If you are consistently getting incorrect answers, please see my Solving Equations Common Mistakes video.

$$\begin{array}{r}
 \frac{3}{1} \cdot \frac{2(2a+1)}{3} = 3(a-2) \cdot \frac{3}{1} \\
 2(2a+1) = 9(a-2) \\
 4a+2 = 9a-18 \\
 +18 \quad +18 \\
 4a+20 = 9a \\
 -4a \quad -4a \\
 20 = 5a \\
 \frac{20}{5} = \frac{5a}{5} \\
 4 = a \\
 \boxed{4 = a}
 \end{array}$$

Solving Equations w/ Variables on Both Sides

Here are some more examples - this time without the use of the balance scale.

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

$$-10 + 7 = -6y + 8$$

$$-5y - 7 = -6y + 8$$

$$+6y \quad +6y$$

$$5y - 7 = 15$$

$$+7 \quad +7$$

$$\frac{5y}{5} = \frac{15}{5}$$

$$\boxed{y = 5}$$

$$\frac{x + 10}{2} = 3$$

$$\frac{(x + 10) \cdot 2}{2} = \frac{3 \cdot 2}{2}$$

$$x + 10 = 6$$

$$-10 = -10$$

$$\boxed{x = -4}$$

If you are consistently getting incorrect answers, please see my Solving Equations Common Mistakes video.

$$\frac{3}{1} \cdot \frac{2(2a + 1)}{3} = 3(a - 2) \cdot \frac{3}{1}$$

$$2(2a + 1) = 9(a - 2)$$

$$4a + 2 = 9a - 18$$

$$+18 = +18$$

$$4a + 20 = 9a$$

$$-4a = -4a$$

$$\frac{20}{5} = \frac{5a}{5}$$

$$\boxed{4 = a}$$

Solving Equations w/ Variables on Both Sides

Here are some more examples - this time without the use of the balance scale.

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

$$\begin{aligned}
 -1(y + 7) &= -6y + 8 \\
 -y - 7 &= -6y + 8 \\
 +6y &= +6y \\
 5y - 7 &= 8 \\
 +7 &= +7 \\
 \frac{5y}{5} &= \frac{15}{5}
 \end{aligned}$$

$$y = 5$$

$$\begin{aligned}
 \frac{x + 10}{2} &= 3 \\
 \frac{2}{1} \cdot \frac{(x + 10)}{2} &= 3 \cdot \frac{2}{1} \\
 x + 10 &= 6 \\
 -10 &= -10 \\
 \boxed{x = -4}
 \end{aligned}$$

If you are consistently getting incorrect answers, please see my Solving Equations Common Mistakes video.

$$\begin{aligned}
 \frac{3}{1} \cdot \frac{2(2a + 1)}{3} &= 3(a - 2) \cdot \frac{3}{1} \\
 2(2a + 1) &= 9(a - 2) \\
 4a + 2 &= 9a - 18 \\
 +18 &= +18 \\
 4a + 20 &= 9a \\
 -4a &= -4a \\
 \frac{20}{5} &= \frac{5a}{5} \\
 4 &= a
 \end{aligned}$$

$$4 = a$$

Solving Equations w/ Variables on Both Sides

Here are some more examples - this time without the use of the balance scale.

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

$$-1(y + 7) = -6y + 8$$

$$-y - 7 = -6y + 8$$

$$+6y = +6y$$

$$5y - 7 = 8$$

$$+7 = +7$$

$$\frac{5y}{5} = \frac{15}{5}$$

$$y = 5$$

$$\frac{x + 10}{2} = 3$$

$$\frac{2}{1} \cdot \frac{(x + 10)}{2} = 3 \cdot \frac{2}{1}$$

$$2) \frac{x + 10}{2} = 3$$

$$4) \frac{2(2x + 1)}{3} = 3(x)$$

If you are consistently getting incorrect answers, please see my Solving Equations Common Mistakes video.

Solving Equations w/ Variables on Both Sides

REMEMBER:

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

as things get more complicated, you'll want to rely more on your algebraic computation and not on the balance, but the f-balance should give you a good understanding.

$$3(x + 2) = -5 - 2(x - 3)$$

$$3x + 6 = -5 - 2x + 6$$

$$= -2x + 6 - 5$$

$$3x + 6 = -2x + 1$$

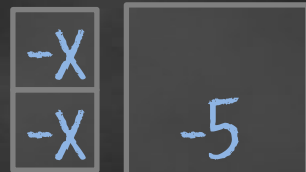
$$+2x \quad = +2x$$

$$5x + 6 = 1$$

$$-6 \quad = -6$$

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

$$x = -1$$



Solving Equations w/ Variables on Both Sides

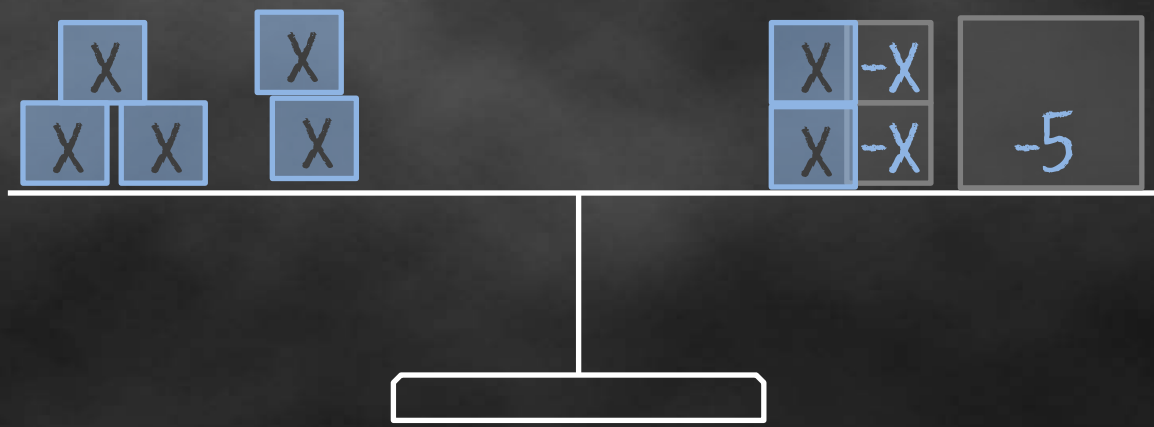
REMEMBER:

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- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

as things get more complicated, you'll want to rely more on your algebraic computation and not on the balance, but the f-balance should give you a good understanding.

$$\begin{aligned}
 3(x+2) &= -5 - 2(x-3) \\
 3x + 6 &= -5 - 2x + 6 \\
 &= -2x + 6 - 5 \\
 3x + 6 &= -2x + 1 \\
 +2x &= +2x \\
 5x + 6 &= 1 \\
 -6 &= -6 \\
 \frac{5x}{5} &= \frac{-5}{5}
 \end{aligned}$$

$x = -1$



Solving Equations w/ Variables on Both Sides

REMEMBER:

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

as things get more complicated, you'll want to rely more on your algebraic computation and not on the balance, but the f-balance should give you a good understanding.

$$3(x + 2) = -5 - 2(x - 3)$$

$$3x + 6 = -5 - 2x + 6$$

$$= -2x + 6 - 5$$

$$3x + 6 = -2x + 1$$

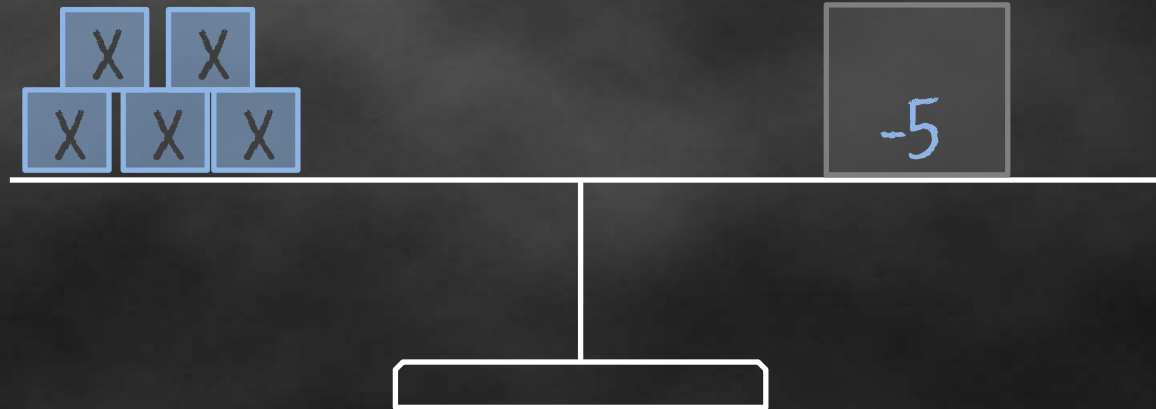
$$+2x \quad = +2x$$

$$5x + 6 = 1$$

$$-6 \quad = -6$$

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

$$x = -1$$



Solving Equations w/ Variables on Both Sides

REMEMBER:

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

as things get more complicated, you'll want to rely more on your algebraic computation and not on the balance, but the f-balance should give you a good understanding.

$$3(x + 2) = -5 - 2(x - 3)$$

$$3x + 6 = -5 - 2x + 6$$

$$= -2x + 6 - 5$$

$$3x + 6 = -2x + 1$$

$$+2x \quad = +2x$$

$$5x + 6 = 1$$

$$-6 \quad = -6$$

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

$$x = -1$$



Solving Equations w/ Variables on Both Sides

REMEMBER:

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

$$x = |x$$

$$-x = -|x$$

$$3(x + 2) = -5 - 2(x - 3)$$

$$3x + 6 = -5 - 2x + 6$$

$$3x + 6 = -2x + 6 - 5$$

$$3x + 6 = -2x + 1$$

$$+2x \quad = +2x$$

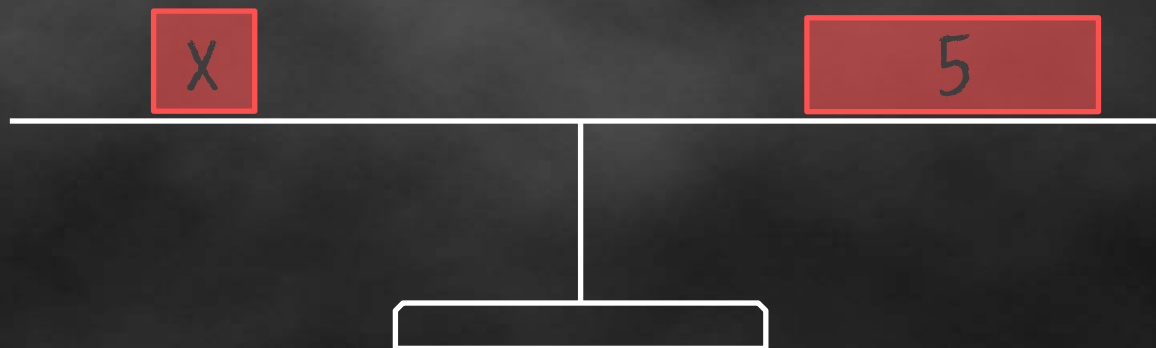
$$5x + 6 = +1$$

$$-6 \quad = -6$$

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

$$x = -1$$

$$x = -1$$



Solving Equations w/ Variables on Both Sides

A One-Step Equation only needs to perform one operation in order to solve/ isolate the variable.

$$5 + x = 12$$

$$-5 \quad = -5$$

$$\boxed{x = 7}$$

Solving Equations w/ Variables on Both Sides

-5

REMEMBER:

- 1) Seek to Isolate the variable TO ONE SIDE.
- 2) Cancel by doing the opposite operation.
- 3) Do the same thing to both sides.

as things get more complicated, you'll want to rely more on your algebraic computation and not on the balance, but the f-balance should give you a good understanding.

-X

$$3(x + 2) = -5 - 2(x - 3)$$

$$3x + 6 = -5 - 2x + 6$$

$$3x + 6 = -2x + 6 - 5$$

$$3x + 6 = -2x + 1$$

$$+2x \quad = \quad +2x$$

$$5x + 6 = 1$$

$$-6 \quad = \quad -6$$

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

$$x = -1$$

$$x + 2$$

$$x + 2$$

$$x + 2$$

$$-5$$

$$x + -3$$

$$x + -3$$



Solving Equations w/ Variables on Both Sides

-5

REMEMBER:

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- 3) Do the same thing to both sides.

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$$3(x + 2) = -5 - 2(x - 3)$$

$$3x + 6 = -5 - 2x + 6$$

$$3x + 6 = -2x + 6 - 5$$

$$3x + 6 = -2x + 1$$

$$+2x \quad = \quad +2x$$

$$5x + 6 = 1$$

$$-6 \quad = \quad -6$$

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

$$x = -1$$

$$x = -1$$

