

Equations & Inequalities



Day	Topic	Homework	IXL	Grade
1	Solving equations	Worksheet 1	S.5	
2	Solving inequalities	Worksheet 2	S.6	
3	Graphing Inequalities	Worksheet 3	T.2	
4	Vocabulary/combining like terms	Worksheet 4	T.1	
5	Eq - Solving by combining like terms	Worksheet 5	S.8	
6	Ineq - Solving by combining like terms	Study for Quiz	T.3	
7	Quiz	Worksheet 6	T.4	
8	Eq - Solving with variables on both sides	Worksheet 7	T.5	
9	Ineq - Solving with variables on both sides	Worksheet 8	T.6	
10	Eq - Solving with distributive property	Worksheet 9		
11	Ineq - Solving with distributive property	Worksheet 10		
12	Practice	Finish Review Packet		
13	Review	Study for Test		
14	Unit Test	None		



Name: _____

EQUATIONS AND INEQUALITIES (EI)

Date: 10/3/18 Solving Equations Review

1) $x + 4 = 19$

$$\begin{array}{r|l} -4 & -4 \\ \hline x = 15 \end{array}$$

Checks
 $x + 4 = 19$ original
 $15 + 4 = 19$ Substitute
 $19 = 19 \checkmark$ Calculate

2) $x - 8 = 2$

$$\begin{array}{r|l} +8 & +8 \\ \hline x = 10 \end{array}$$

Goal: get the x alone

$$\begin{aligned} x - 8 &= 2 \\ 10 - 8 &= 2 \\ 2 &= 2 \checkmark \end{aligned}$$

3) $-2x = 20$

$$\begin{array}{r|l} -2 & -2 \\ \hline x = -10 \end{array}$$

$$\begin{aligned} -2x &= 20 \\ -2(-10) &= 20 \\ 20 &= 20 \checkmark \end{aligned}$$

4) $\frac{x}{7} = (-4)(7)$

$$\begin{array}{r|l} & \\ \hline x = -28 \end{array}$$

$$\begin{aligned} \frac{x}{7} &= -4 \\ \frac{-28}{7} &= -4 \\ -4 &= -4 \checkmark \end{aligned}$$

$$\begin{array}{l} \bullet -3 \uparrow \\ +9 \uparrow \end{array}$$

$$\begin{array}{r} 5) -3x + 9 = -15 \\ -9 \quad -9 \\ \hline -3x = -24 \\ \frac{-3}{-3} \quad \frac{-24}{-3} \\ \hline \boxed{x = 8} \end{array}$$

Check

$$\begin{array}{l} -3x + 9 = -15 \\ -3(8) + 9 = -15 \\ -15 = -15 \checkmark \end{array}$$

$$\begin{array}{r} 6) \frac{x}{10} - 8 = -3 \\ +8 \quad +8 \end{array}$$

$$\begin{array}{r} \cancel{10} \cdot \frac{x}{\cancel{10}} = 5 \cdot 10 \\ x = 50 \end{array}$$

$$\frac{x}{10} - 8 = -3$$

$$\frac{50}{10} - 8 = -3$$

$$\begin{array}{l} 5 - 8 = -3 \\ -3 = -3 \checkmark \end{array}$$

Date: 10/4/18 Day 2 Solving Inequalities

~~INEQUALITY~~
> greater than
< less than

INEQUALITY
"NOT" \geq greater than or equal to
 \leq less than or equal to

Goal: Get x alone

$$\begin{array}{r} 1) x + 2 > 5 \\ -2 \quad -2 \\ \hline \boxed{x > 3} \end{array}$$

$$\begin{array}{r} 2) x - 14 < 21 \\ +14 \quad +14 \\ \hline \boxed{x < 35} \end{array}$$

$$\begin{array}{r} 3) 2x \geq 10 \\ \bar{2} \quad \bar{2} \\ \hline \boxed{x \geq 5} \end{array}$$

$$\begin{array}{r} 5 \cdot \\ 4) \frac{x}{5} \leq -2 \cdot 5 \\ \hline \boxed{x \leq -10} \end{array}$$

$$5) 2x + 8 < -14$$

$$\begin{array}{r|l} -8 & -8 \\ \hline 2x & < -22 \\ \frac{2}{2} & \frac{2}{2} \end{array}$$

$$x < -11$$

$$6) \frac{x}{4} + 2 \geq 10$$

$$\begin{array}{r|l} -2 & -2 \\ \hline 4 \cdot \frac{x}{4} & \geq 8 \cdot 4 \end{array}$$

$$x \geq 32$$

$$7) -6x > 36$$

$$\begin{array}{r|l} -6 & -6 \\ \hline -6x & > 36 \\ \hline \cancel{-6x} & \cancel{>} \cancel{-6} \end{array}$$

$$x < -6$$

$$\begin{array}{l} \cdot -1 \\ 5 \boxed{>} 2 \quad -5 \boxed{<} -2 \end{array}$$

$$-3 \boxed{>} -4 \quad 3 \boxed{<} 4$$

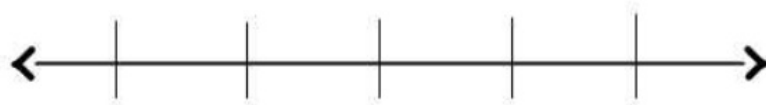
$$-10 \boxed{<} 7 \quad 10 \boxed{>} -7$$

If you multiply or divide by a negative, you must flip over the inequality symbol.

Date: _____ Day 3 Graphing

$x > 6$ \Rightarrow What does it mean?

$x > 6$



$x \leq 2$



$x \geq -1$



$x < -10$



$15 < x$

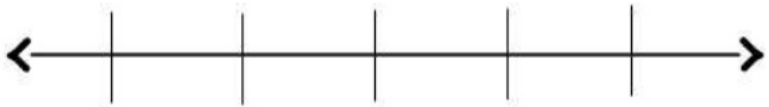


Solve the inequality and graph its solution.

1) $x + 10 > 4$



2) $x - 8 \leq 20$



3) $\frac{x}{4} < 2$



4) $3x \geq 12$



5) $-5x \leq -25$



6) $\frac{x}{-1} > 4$



7) $-3x + 8 \leq 17$



8) $\frac{x}{4} - 6 < -3$



Date: _____ Day 4 Vocabulary/Combine Like Terms

What is a variable?

What is a polynomial?

What is a monomial?

What is a binomial?

What is a trinomial?

What is a term?

What are "like terms"?

What does it mean to combine "like terms"?

Circle the like terms: $8x$ $-9x$ $10x^2$ x $-xy$

Circle the like terms: $8a^2b$ $11ab^2$ $-a^2b$ a^2b^2 $7a^2b$

List all the terms in the expression:

1) $8ax + 4ab - 6ac - d + 7$

2) $2x + 6$

3) $19 - 5x + 18 - 4x$

Combine like terms.

4) $3x + 5x + 8x + 9x$

5) $9x - 2x + 7x - 4x$

6) $11x + 7 - 8x - 9x + 2 + 3$

7) $4a + 6b - 7c - 4a - 7b + 8c$

8) $9x + 9x^2 - 24x^2 + 7x$

9) $8x^2 - x^2$

10) $r + s - t + t + t + r - 2s - 2r + s - t$

Date: 10/10/18 Day 5

Solving Equations by Combining Like Terms First

Solve and check by combining like terms first.

1) $9x - 7x = 24$

$$\begin{array}{r|l} 2x = 24 & \\ \hline 2 & 2 \\ \hline x = 12 & \end{array}$$

Check
 $9x - 7x = 24$
 $9(12) - 7(12) = 24$
 $24 = 24 \checkmark$

$$\begin{array}{r} 108 - 84 \\ \hline 24 \end{array}$$

2) $2 + 5x - 8 = 29$

$$\begin{array}{r|l} 5x - 6 = 29 & \\ +6 & +6 \\ \hline 5x = 35 & \\ \hline 5 & 5 \\ \hline x = 7 & \end{array}$$

Check
 $2 + 5x - 8 = 29$
 $2 + 5(7) - 8 = 29$
 $29 = 29 \checkmark$

3) $-5x + 9 - 7x - 18 = -3$

$$\begin{array}{r|l} -12x - 9 = -3 & \\ +9 & +9 \\ \hline -12x & 6 \\ \hline -12 & 12 \\ \hline x = -5 & \end{array}$$

Check
 $-5x + 9 - 7x - 18 = -3$
 $-5(5) + 9 - 7(5) - 18 = -3$
 $-3 = -3 \checkmark$

$$4) \frac{x}{7} + 19 - 12 = 4$$

$$\frac{x}{7} + 7 = 4$$

$$\frac{x}{7} + 7 - 7 = 4 - 7$$

$$7 \cdot \frac{x}{7} = -3 \cdot 7$$

$$x = -21$$

$$\frac{x}{7} + 19 - 12 = 4$$

$$\frac{-21}{7} + 19 - 12 = 4$$

$$5) -2x + 2x + 2x - 3x + 3x - 5x + 4x = 14$$

$$1x = 14$$

$$x = 14$$

$$-2x + 2x + 2x - 3x + 3x - 5x + 4x = 14$$

$$-2(14) + 2(14) + 2(14) - 3(14) + 3(14) - 5(14) + 4(14) = 14$$

$$14 = 14$$

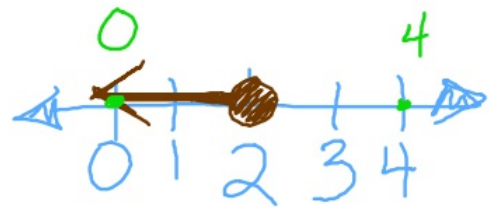
$$6) 5x + 13 - 14x + 12 = 7$$

Date: 10/11/18 Day 6 Solving Inequalities by Combining Like Terms

Solve for x and graph the solution.

$$1) \overset{-20+4-12-12}{-5(4)+4-3(4)-12} (-5x) + 4 - 3x - 12 \geq -24$$

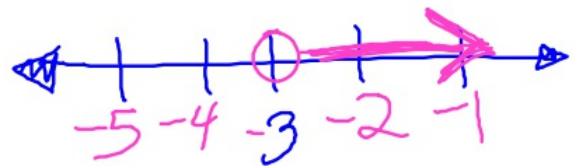
$$\begin{array}{r} -8x - 8 \geq -24 \\ + 8 \quad + 8 \\ \hline -8x \geq -16 \\ -8 \quad -8 \\ \hline x \leq 2 \end{array}$$



$$\begin{array}{l} 0 + 4 - 0 - 12 \\ -8 \geq -24 \text{ true} \\ -40 \geq -24 \text{ false} \end{array}$$

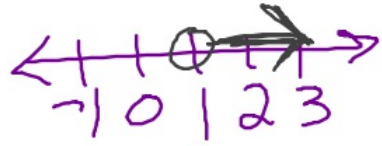
$$2) 5(-4x) + 12(-3x) < 38$$

$$\begin{array}{r} -7x + 17 < 38 \\ -17 \quad -17 \\ \hline -7x < 21 \\ -7 \quad -7 \\ \hline x > -3 \end{array}$$



$$3) 25x - 3 - 12x - 3x + 8 > 15$$

$$\begin{array}{r}
 10x + 5 > 15 \\
 \hline
 10x > 10 \\
 \frac{10x}{10} > \frac{10}{10} \\
 \boxed{x > 1}
 \end{array}$$



$$4) 5x + 8 - 11x - 2 \leq 36$$

$$\begin{array}{r}
 -6x + 6 \leq 36 \\
 \hline
 -6x \leq 30 \\
 \frac{-6x}{-6} \leq \frac{30}{-6} \\
 \boxed{x \geq -5}
 \end{array}$$



Date: 10/16 - Day 8 - Solving Equations with Variables on Both Sides

Solve for x and check.

1) $4x + 5 = 2x + 9$

$$\begin{array}{r|l} -2x & -2x \\ \hline 2x + 5 = 9 & \\ -5 & -5 \\ \hline 2x = 4 & \\ \frac{2x}{2} = \frac{4}{2} & \\ \hline \boxed{x=2} & \end{array}$$

$4x + 5 = 2x + 9$ 13

$4(2) + 5 = 2(2) + 9$

$13 = 13 \checkmark$

2) $7x + 19 = -2x + 55$

$$\begin{array}{r|l} +2x & +2x \\ \hline 9x + 19 = 55 & \\ -19 & -19 \\ \hline 9x = 36 & \\ \frac{9x}{9} = \frac{36}{9} & \\ \hline \boxed{x=4} & \end{array}$$

$7x + 19 = -2x + 55$

$7(4) + 19 = -2(4) + 55$

$47 = 47 \checkmark$

$$\begin{array}{r|l}
 3) x + 2 = 3x - 1 & \\
 -x & -x \\
 \hline
 2 = 2x - 1 & \\
 +1 & +1 \\
 \hline
 \frac{3}{2} = \frac{2x}{2} & \\
 \hline
 \boxed{1.5 = x} &
 \end{array}$$

Gia's

$$\begin{array}{r|l}
 x + 2 = 3x - 1 & \\
 -3x & -3x \\
 \hline
 -2x + 2 = -1 & \\
 -2 & -2 \\
 \hline
 -2x = -3 & \\
 -2 & -2 \\
 \hline
 \boxed{x = 1.5} &
 \end{array}$$

$$\begin{aligned}
 x + 2 &= 3x - 1 \\
 1.5 + 2 &= 3(1.5) - 1 \\
 3.5 &= 3.5 \checkmark
 \end{aligned}$$

Michaelis

$$\begin{array}{r|l}
 4) 12x + 21 = 9x & \\
 -12x & -12x \\
 \hline
 21 = -3x & \\
 -3 & -3 \\
 \hline
 \boxed{-7 = x} &
 \end{array}$$

Hannah's

$$\begin{array}{r|l}
 12x + 21 = 9x & \\
 -9x & -9x \\
 \hline
 3x + 21 = 0 & \\
 -21 & -21 \\
 \hline
 3x = -21 & \\
 \frac{3}{3} & \frac{-21}{3} \\
 \hline
 \boxed{x = -7} &
 \end{array}$$

Date: ____ Day 9 Solving Inequalities with Variables on Both Sides

Solve for the variable and graph the solution on a number line.

1) $10x + 13 > 5x + 33$

2) $19x - 8 < 10x + 91$

$$3) -11a + 4 \leq 16 - 7a$$

$$4) 3b - 8 \geq 5b + 16$$

Date: 10/18/18 Day 10

Solving Equations using the Distributive Property

Solve for x and check.

1) $-11(x + 6) = 33$

$$\begin{array}{r} \cancel{-11} \quad \quad \quad \cancel{-11} \\ \cancel{x+6} = -3 \\ \cancel{-6} \quad \quad \quad \cancel{-6} \\ \hline x = -9 \end{array}$$

2) $5(-x - 6) = -100$

$$\begin{array}{r} -5x - 30 = -100 \\ +30 \quad +30 \\ \hline -5x = -70 \\ \underline{-5} \quad \underline{-5} \\ x = 14 \end{array}$$

3) $-4 - 2(x + 8) = -30$

$$\begin{array}{r} -4 \quad \underline{-2x} \quad \underline{-16} = -30 \\ -2x - 20 = -30 \\ +20 \quad +20 \\ \hline -2x = -10 \\ \underline{-2} \quad \underline{-2} \\ x = 5 \end{array}$$

$+6 \uparrow$
 $\bullet -11 \uparrow$

Check

$$\begin{aligned} -11(x+6) &= 33 \\ -11(-9+6) &= 33 \\ 33 &= 33 \\ &\checkmark \end{aligned}$$

$2(x+4) = 2x+8$

$$\begin{array}{r} -11(x+6) = 33 \\ -11x - 66 = 33 \\ +66 \quad +66 \\ \hline -11x = 99 \\ \underline{-11} \quad \underline{-11} \\ x = -9 \end{array}$$

Check

$$\begin{aligned} 5(-x-6) &= -100 \\ 5(-14-6) &= -100 \\ -100 &= -100 \checkmark \end{aligned}$$

$$\begin{aligned} -4 - 2(x+8) &= -30 \\ -4 - 2(5+8) &= -30 \\ -30 &= -30 \\ &\checkmark \end{aligned}$$

$$4) 6(x + 2) = 90$$

$$6x + 12 = 90$$

$$\underline{-12 \quad -12}$$

$$6x = 78$$

$$\underline{6 \quad 6}$$

$$x = 13$$

$$6(x + 2) = 90$$

$$6(13 + 2) = 90$$

$$90 = 90 \checkmark$$

$$5) -5(x - 8) = -10$$

$$-5x + 40 = -10$$

$$\underline{-40 \quad -40}$$

$$-5x = -50$$

$$\underline{-5 \quad -5}$$

$$x = 10$$

$$-5(x - 8) = -10$$

$$-5(10 - 8) = -10$$

$$-10 = -10 \checkmark$$

$$-5(x - 8)$$

$$-5x + 40$$

$$6) 10 - 1(x + 4) = 2$$

$$10 - x - 4 = 2$$

$$\underline{-6 \quad -x \quad = \quad 2}$$

$$\underline{-6 \quad -x \quad = \quad 2}$$

$$x = 4$$

$$6 - x = 2$$

$$-x = -4$$

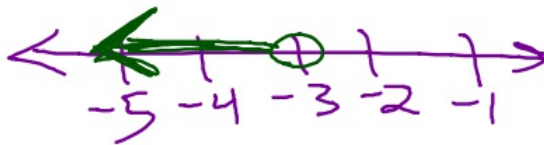
$$x = 4$$

$$6 - 4 = 2 \text{ so } x = 4$$

Date: 10/23/18 Day 11 Solving Inequalities Using the Distributive Property

Solve the inequality and graph the solution.

$$\begin{array}{r}
 1) -5(x+8) > -25 \\
 -5x - 40 > -25 \\
 +40 \quad +40 \\
 \hline
 -5x > 15 \\
 \frac{-5}{-5} \quad \frac{15}{-5} \\
 \boxed{x < -3}
 \end{array}$$



$$\begin{array}{r}
 2) 5 - 1(x+9) < 13 \\
 5 - 1x - 9 < 13 \\
 -1x - 4 < 13 \\
 +4 \quad +4 \\
 \hline
 -1x < 17 \\
 \frac{-1}{-1} \quad \frac{17}{-1} \\
 \boxed{x > -17}
 \end{array}$$



$$3) 4(x+3) - 7(x+9) \leq -12$$

$$\begin{array}{r}
 4) 2(x+18) - 4x + 18 \geq 5x - 3 \\
 2x + 36 - 4x + 18 \geq 5x - 3 \\
 -2x + 54 \geq 5x - 3 \\
 +2x \quad +2x \\
 \hline
 54 \geq 7x - 3 \\
 +3 \quad +3 \\
 \hline
 57 \geq 7x \\
 \frac{57}{7} \geq \frac{7x}{7}
 \end{array}$$



$$8\frac{1}{7} \geq x$$