

Name _____

Algebra 2
Lesson 1-4
Solving Inequalities

An **inequality** is a statement where one side will be bigger or smaller than the other side. The less than ($<$), greater than ($>$), less than or equal to (\leq), and greater than or equal to (\geq) signs are used for these equations. See examples:

$$3n+2<6$$

$$2y\geq 0$$

$$5x+3<2x+1$$

Inequalities are solved the same way as linear equations (lesson 1-3), with the following conditions:

1. If you divide both sides of the inequality by a negative, reverse the direction of the arrow (change $<$ to $>$ or $>$ to $<$).
2. Keep the variable **to the left**
3. Write the final answer with a positive variable

Note: sometimes you will solve the inequality and find that there are no solutions or that all real numbers *a.k.a. identity solution* are solutions. These will be apparent as the variable will disappear and you will be either left with a true statement like $5 < 8$ (solution is all real numbers) or $0 > -6$ (no solution).

And and or

To solve a pair of inequalities containing **and**, find all values of the variable that make both inequalities true.

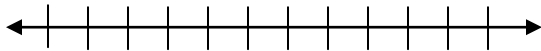
To solve a pair of inequalities containing **or**, find all values of the variable that make *at least one* of the inequalities true.

Examples: Solve and show answer on number line:

1. $5n+3<-2$

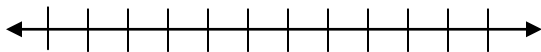
4. True or false?

$-1 < x$ and $x \leq -3$ may also be written as $1 < x \leq -3$

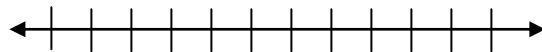


2. $18+5x\geq 2x-3$

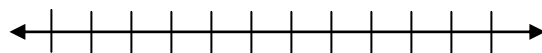
5. $3x-1 > -28$ and $2x+7 < 19$



3. $4x+5 < 4(x+2)$



6. $4y-2\geq 14$ or $3y-4\leq -13$



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Algebra 2
Problem set 1-4
Solving Inequalities

Solve.

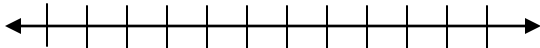
1. $3x+2(5x-6)=0.5(8x-10)$

2. $3x+8<-10$

3. $18+3x\geq 4(x-6)$



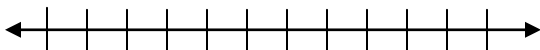
4. $3(x-5)+4<4(2x+3)=1$



5. $6x\geq -24$ and $9x<54$



6. $8x>32$ or $-6x-8\leq 40$



7. One monthly cell phone plan charges \$40 plus \$0.08 per minute after the first 300 minutes. Another monthly cell phone plan charges \$55 plus \$0.12 per minute after the first 450 minutes. Both plans would cost the same after _____ minutes.

8. The sum of any triangle's interior angles is 180° . One angle is twice the middle angle x , and the third angle is 20° less than the middle angle. Find the measure of each angle.

9. Rosa earns \$8.50 an hour as a cashier. She wants to earn more than \$550. How many regular hours must she work to reach her goal?

10. Finish the sentence. The Main difference between an identity solution and no solution of a linear equation is _____.