

Solving Compound Inequalities – 1 variable

Procedure:

1. Determine if the compound inequality is connected by “and” or “or”.
2. Solve each inequality
3. If compound inequality is connected by an “and”, then the solution must satisfy each statement. The solution is where the graphs of each **overlap**.
- 3a. If the compound inequality is connected by an “or” statement, then the solution can satisfy either or both statements. The solution is the union of the 2 sets, the graph of both solutions.

2 Examples

Example 1 Solve for x; $-11 < 2x + 1 < 7$

1. It's written as a double inequality, therefore it's an “and” statement.
2. Solve $-11 < 2x + 1$ **and** $2x + 1 < 7$
 $-12 < 2x$ $2x < 6$
 $-6 < x$ $x < 3$
3. Numbers greater than -6 and less than 3 , written as
 $-6 < x < 3$

Example 2 Solve for x $3x - 2 > 10$ or $2x + 3 \leq -15$

1. It an “or” statement
2. Solve both inequalities $3x - 2 > 10$ **OR** $2x + 3 \leq -15$
 $3x > 12$ $2x \leq -18$
 $x > 4$ $x \leq -9$

The solution is $x \leq -9 \cup x > 4$

Solve and graph for x.

1. $-3 < 2x + 1 < 9$
2. $5x - 4 > 16$ or $3x + 4 < -14$
3. $-8 \leq 3x - 2 \leq 10$
4. $2x + 7 \geq 15$ or $3x + 7 \leq -19$
5. $-5 < x - 3 < 7$
6. $4x + 1 > 13$ or $4x + 1 < -11$
7. $-10 \leq 2x + 4 \leq 14$
8. $3x - 6 \geq 9$ or $x - 6 \leq -12$
9. $-7 < 4x - 1 < 13$
10. $x + 8 > 15$ or $2x + 8 < 10$
11. $-6 \leq 5x + 4 \leq 19$
12. $2x - 9 \geq 7$ or $2x - 9 \leq -13$

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Solve and graph for x.

1. $-11 < 3x + 4 < 13$
2. $4x - 5 > 19$ or $4x - 5 < -13$
3. $-9 \leq 2x - 7 \leq 15$
4. $5x + 2 \geq 22$ or $5x + 2 \leq -18$
5. $-14 < 4x + 2 < 18$
6. $3x - 1 > 11$ or $3x - 2 < -13$
7. $-8 \leq 6x - 2 \leq 22$
8. $2x + 5 \geq 17$ or $2x + 5 \leq -11$
9. $-12 < 5x - 7 < 23$
10. $7x + 1 > 29$ or $7x + 1 < -27$
11. $-15 \leq 3x + 6 \leq 21$
12. $4x - 3 \geq 13$ or $4x - 3 \leq -19$

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Solve and graph for x.

1. $-18 < 2(2x+1) < 22$
2. $3(2x-1) > 21$ or $3(2x-1) < -18$
3. $-10 \leq 4(x-2) \leq 14$
4. $2(3x+5) \geq 28$ or $2(3x+5) \leq -10$
5. $-16 < 3(x+1) < 20$
6. $5(x-2) > 25$ or $5(x-2) < -15$
7. $-12 \leq 2(2x-3) \leq 24$
8. $4(x+1) \geq 20$ or $6(x+3) \leq -12$
9. $-21 < 5x+4 < 24$
10. $3(x-4) > 18$ or $3(x-4) < -24$
11. $-14 \leq 3(x+2) \leq 19$
12. $2(4x-1) \geq 30$ or $3(2x-4) \leq -18$