# Solve and Graph Inequalities — Homework

*Lesson 8-6 • Standard 6.AT.8*

**Name:** _____ **Period:** _____ **Date:** _____

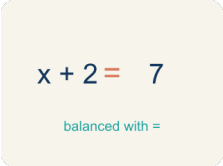
## Today's Goals

Content: I can solve an inequality and graph its solution set on a number line.
Language: I can explain my work using the words solve, graph, solution, and substitute.

## Key Words




**Solve and Graph Inequalities (Resolver y representar desigualdades)** — Isolate the variable, then show the complete solution set on a number line.




**Solve (Resolver)** — To find the number that makes it true.



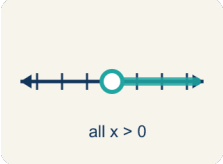
**Graph (Graficar)** — To show answers on a number line with circles and shading.



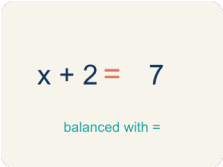

**Solution (Solución)** — A number that makes the equation or inequality true.




**Substitute (Sustituir)** — To put a number in place of a letter.




**Solution set (Conjunto solución)** — All the numbers that make the inequality true.




**Inverse operation (Operación inversa)** — Two math actions that undo each other, like × and ÷.

## Practice

*Show your work. Use the blank space under each problem.*

**1. Solve: x + 6 > 14**

A. x > 8
B. x < 8
C. x = 8
D. x > 20

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**2. Solve: x − 9 ≤ 3**

A. $x \leq 6$
B. $x \leq 12$
C. $x \geq 12$
D. $x = 12$

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**3. Solve each inequality, describe the inverse operation, and describe the graph.**

| Inequality | Inverse Operation | Solution | Graph Description |
|---|---|---|---|
| $x + 11 \geq 20$ | Subtract 11 | $x \geq 9$ | Closed circle at 9, shade right |
| $x - 3 < 7$ | Add 3 | $x < 10$ | Open circle at 10, shade left |
| $x + 8 \leq 20$ | Subtract 8 | $x \leq 12$ | Closed circle at 12, shade left |

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**4. Is $x = 5$ a solution to $x + 4 > 12$?**

A. No, because $5 + 4 = 9$, and 9 is not greater than 12
B. Yes, because $5 + 4 = 9$
C. Yes, because $5 > 4$
D. No, because $5 < 12$

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**5. Solve each inequality first, then sort by whether $x = 10$ is a solution.**

*Groups: $x = 10$ IS a solution | $x = 10$ is NOT a solution*

- $x + 2 > 8$ → _____
- $x - 5 \geq 3$ → _____
- $x + 1 \leq 15$ → _____
- $x + 3 > 15$ → _____
- $x - 2 \geq 9$ → _____
- $x + 6 < 10$ → _____

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**6. Catch the Open vs. Closed Circle Mistake**

Step 1 (Inequality): $x - 4 \geq 9$
Step 2 (Inverse operation): Add 4 to both sides
Step 3 (Simplify): $x \geq 13$
Step 4 (Graph): Open circle at 13, shade right
*Which step has the mistake? Explain and fix it:*

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**7. Clue 1: Which value is a solution of $x > 7$?**

A. 3
B. 5
C. 7
D. 9

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**8. Clue 2: Is 5 a solution of $x \leq 5$?**

A. Yes, because $5 \leq 5$ is true
B. No, because 5 is not less than 5
C. No, because ≤ means only smaller numbers
D. Yes, but only because 5 is odd

**9. Detective, sort each suspect's badge number into the right vault door for the rule x ≥ 4. A value is a solution if it makes x ≥ 4 true.**

*Groups: Solution of x ≥ 4 | NOT a solution of x ≥ 4*

- 9 → _____
- 5 → _____
- 4 → _____
- 3 → _____
- 2 → _____
- 0 → _____

**10. Match each inequality to the equivalent inequality written with the number first. Both inequalities in a pair must have the same solutions.**

| Item | Answer choices |
|---|---|
| ____ x > 10 | D. 5 > x |
| ____ x ≤ 6 | C. 8 ≤ x |
| ____ x ≥ 8 | B. 6 ≥ x |
| ____ x < 5 | A. 10 < x |