

Solving Inequalities Worksheet

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Part 1: Building a Foundation

Which of the following symbols represents "less than or equal to"?

Hint: Think about the symbols used in inequalities.

- $>$
- $<$
- \geq
- \leq

Which of the following are types of inequalities? (Select all that apply)

Hint: Consider the different forms inequalities can take.

- Linear Inequalities
- Quadratic Inequalities
- Exponential Inequalities
- Rational Inequalities

Explain what it means to solve an inequality. How is it different from solving an equation?

Hint: Consider the nature of the solutions in both cases.

List the four main inequality symbols and provide a brief description of each.

Hint: Think about the symbols you use in inequalities.

1. Symbol: <

2. Symbol: >

3. Symbol: \leq

4. Symbol: \geq

Part 2: Comprehension and Interpretation

When solving the inequality $3x - 5 > 7$, what is the first step?

Hint: Think about how to isolate the variable.

- Add 5 to both sides
- Subtract 5 from both sides
- Divide both sides by 3
- Multiply both sides by 3

Which of the following statements are true about inequalities? (Select all that apply)

Hint: Consider the properties of inequalities when performing operations.

- Multiplying both sides by a negative number reverses the inequality sign.
- Adding the same number to both sides of an inequality changes the inequality sign.
- Inequalities can be represented on a number line.
- Dividing both sides by a positive number keeps the inequality sign the same.

Describe how you would graph the solution to the inequality $x \leq 4$ on a number line.

Hint: Think about how to represent the endpoint and the direction of the line.

Part 3: Application and Analysis

Solve the inequality $2x + 3 \leq 11$ and choose the correct solution.

Hint: Isolate x by performing inverse operations.

- $x \leq 4$
- $x \geq 4$
- $x \leq 5$
- $x \geq 5$

Which of the following are solutions to the inequality $x^2 - 4x < 0$? (Select all that apply)

Hint: Consider the roots of the equation and the intervals they create.

- $x = 0$
- $x = 2$
- $x = 4$
- $x = -1$

A store offers a discount such that the total cost C of an item after discount is less than \$50. If the original price is \$60 and the discount is represented by d , write an inequality to represent this situation and solve for d .

Hint: Think about how to express the total cost in terms of the discount.

Consider the compound inequality $1 < 2x + 3 \leq 7$. What is the solution for x ?

Hint: Break the compound inequality into two parts to solve.

- $1 < x \leq 2$
- $-1 < x \leq 2$
- $1 < x < 2$
- $-1 < x < 2$

Explain how you would solve the inequality $(x+1)/(x-2) > 3$. What steps would you take to ensure all solutions are valid?

Hint: Consider how to eliminate the fraction and check for extraneous solutions.

Part 4: Evaluation and Creation

Evaluate the following scenario: If a car must travel at least 60 miles per hour but no more than 80 miles per hour, which inequality best represents this speed range?

Hint: Think about how to express the range of speeds.

- $60 < x < 80$
- $60 \leq x \leq 80$
- $60 > x > 80$
- $60 \geq x \geq 80$

Which of the following inequalities could represent a scenario where a company's profit P is at least \$10,000 but less than \$50,000? (Select all that apply)

Hint: Consider how to express the minimum and maximum profit.

- $10000 \leq P < 50000$
- $10000 < P \leq 50000$
- $10000 \leq P \leq 50000$

$10000 < P < 50000$

Create a real-world problem involving a quadratic inequality. Describe the problem and solve the inequality, explaining each step.

Hint: Think about a scenario that can be modeled with a quadratic expression.