

Inequalities Worksheet

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Part 1: Building a Foundation

Which symbol represents "greater 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 of inequalities you have learned.

- Linear Inequalities
- Quadratic Inequalities
- Exponential Inequalities
- Compound Inequalities

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

Hint: Consider the methods and outcomes of solving both types.

List the four inequality symbols and their meanings.

Hint: Think about the symbols you have encountered in your studies.

1. What does ' $>$ ' mean?

2. What does ' $<$ ' mean?

3. What does ' \geq ' mean?

4. What does ' \leq ' mean?

Part 2: comprehension

What happens to the inequality sign when you multiply or divide both sides of an inequality by a negative number?

Hint: Consider the rules of inequalities when dealing with negative numbers.

- It stays the same
- It reverses
- It becomes an equation
- It disappears

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

Hint: Think about the characteristics of compound inequalities.

- They always involve 'and' or 'or'.
- They can be solved by solving each inequality separately.
- They are only used in linear inequalities.
- They are represented by a single inequality.

Describe how a linear inequality can be represented on a number line.

Hint: Consider the visual representation of inequalities.

Part 3: Application

Solve the inequality: $3x - 5 > 7$. What is the value of x ?

Hint: Isolate x to find the solution.

- $x > 4$
- $x < 4$
- $x > 2$
- $x < 2$

Which of the following inequalities represent the solution to the inequality $2x + 3 \leq 9$? (Select all that apply)

Hint: Solve the inequality to find the correct representations.

- $x \leq 3$
- $x \geq 3$
- $x \leq 6$
- $x \geq 6$

A company wants to ensure that its production cost does not exceed \$5000. If the cost per unit is \$50, write an inequality to represent the maximum number of units that can be produced.

Hint: Consider how to express the total cost in terms of units produced.

Part 4: Analyzing Relationships

Consider the system of inequalities: $y > 2x + 1$ and $y \leq -x + 4$. Which of the following points is a solution to the system?

Hint: Test each point against both inequalities.

- (1, 3)
- (2, 5)
- (0, 0)
- (3, 1)

Which of the following are true about the graph of the inequality $y < 2x - 3$? (Select all that apply)

Hint: Consider the characteristics of the graph of inequalities.

- The line $y = 2x - 3$ is included in the solution.
- The region below the line is shaded.
- The line is dashed.
- The region above the line is shaded.

Analyze the inequality $x^2 - 4x + 3 < 0$. Determine the intervals where the inequality holds true.

Hint: Consider factoring the quadratic expression.

Part 5: Evaluation and Creation

Which of the following real-world scenarios can be modeled by the inequality $x + y \leq 100$?

Hint: Think about constraints in real-life situations.

- A budget constraint where x and y are expenses.
- A speed limit where x is speed and y is time.

- A temperature range where x is minimum and y is maximum.
- A height restriction where x is height and y is width.

Evaluate the following statements and select those that correctly describe the solution set of the inequality $5x - 2 \geq 3x + 4$. (Select all that apply)

Hint: Solve the inequality to find the correct statements.

- $x \geq 3$
- $x \leq 3$
- The solution set includes all numbers greater than or equal to 3.
- The solution set includes all numbers less than or equal to 3.

Create a real-world problem that can be solved using the inequality $4x + 2 \leq 10$. Describe the context and provide a solution.

Hint: Think about a scenario where you have constraints.