Inequalities Worksheet Questions and Answers PDF

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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.

- ◯ >
- ◯ <
- ◯ **≥ ✓**
- ◯ ≤

> The correct symbol for 'greater than or equal to' is '≥'.

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 ✓**

> Linear, Quadratic, and Compound inequalities are types of 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.

Solving an inequality involves finding the range of values that satisfy the inequality, while solving an equation finds specific values.

List the four inequality symbols and their meanings.

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

1. What does '>' mean?

Greater than

2. What does '<' mean?

Less than

3. What does '≥' mean?

Greater than or equal to

4. What does '≤' mean?

Less than or equal to

> The four symbols are: > (greater than), < (less than), ≥ (greater than or equal to), ≤ (less than or equal to).

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

> The inequality sign reverses when multiplying or dividing by a negative number.

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.

> Compound inequalities involve 'and' or 'or' and can be solved separately.

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

Hint: Consider the visual representation of inequalities.

A linear inequality is represented on a number line by shading the region that satisfies the inequality, with an open or closed dot at the boundary.

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

The solution is x > 4.

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

Hint: Solve the inequality to find the correct representations.

- ☐ **x ≤ 3 ✓**
- ☐ x ≥ 3
- ☐ **x ≤ 6 ✓**
- ☐ x ≥ 6

The correct representations are x ≤ 3 and x ≤ 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.

The inequality is $50x \leq 5000$, where x is the number of units.

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)

The point (1, 3) satisfies both inequalities.

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.

The line is dashed and the region below 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.

The inequality holds true in the interval (1, 3).

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.

> A budget constraint where x and y are expenses can be modeled by this inequality.

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.

> The solution set includes all numbers greater 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.

> **An example could be budgeting for a project where each item costs $4, and you want to spend no more than $10.**