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# Solving Inequalities Worksheet Answer Key PDF

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## Part 1: Building a Foundation

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

undefined. >

undefined. <

undefined. ≥

**undefined. ≤ ✓**

The correct symbol for 'less than or equal to' is ≤.

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

**undefined. Linear Inequalities ✓**

**undefined. Quadratic Inequalities ✓**

**undefined. Exponential Inequalities ✓**

**undefined. Rational Inequalities ✓**

Linear, Quadratic, Exponential, and Rational are all types of inequalities.

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

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

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

1. Symbol: <

**Less than**

2. Symbol: >

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**Greater than**

3. Symbol: ≤

**Less than or equal to**

4. Symbol: ≥

**Greater than or equal to**

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

## Part 2: Comprehension and Interpretation

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

**undefined. Add 5 to both sides ✓**

undefined. Subtract 5 from both sides

undefined. Divide both sides by 3

undefined. Multiply both sides by 3

The first step is to add 5 to both sides of the inequality.

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

**undefined. Multiplying both sides by a negative number reverses the inequality sign. ✓**

undefined. Adding the same number to both sides of an inequality changes the inequality sign.

**undefined. Inequalities can be represented on a number line. ✓**

**undefined. Dividing both sides by a positive number keeps the inequality sign the same. ✓**

True statements include that multiplying by a negative reverses the sign, and inequalities can be represented on a number line.

**Describe how you would graph the solution to the inequality x ≤ 4 on a number line.**

**You would place a closed dot on 4 and shade to the left to indicate all values less than or equal to 4.**

## Part 3: Application and Analysis

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**Solve the inequality 2x + 3 ≤ 11 and choose the correct solution.**

**undefined. x ≤ 4 ✓**

undefined. x ≥ 4

undefined. x ≤ 5

undefined. x ≥ 5

The correct solution is x ≤ 4.

**Which of the following are solutions to the inequality x² - 4x < 0? (Select all that apply)**

**undefined. x = 0 ✓**

**undefined. x = 2 ✓**

undefined. x = 4

undefined. x = -1

The solutions are x = 0 and x = 2.

**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.**

**The inequality is 60 - d < 50, which simplifies to d > 10.**

**Consider the compound inequality 1 < 2x + 3 ≤ 7. What is the solution for x?**

undefined. 1 < x ≤ 2

**undefined. -1 < x ≤ 2 ✓**

undefined. 1 < x < 2

undefined. -1 < x < 2

The solution is -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?**

**You would first multiply both sides by (x-2) and then solve the resulting inequality, checking for values that make the denominator zero.**

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## 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?**

undefined. $60 < x < 80$

**undefined. $60 \leq x \leq 80$ ✓**

undefined. $60 > x > 80$

undefined. $60 \geq x \geq 80$

The correct inequality is $60 \leq x \leq 80$.

**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)**

**undefined. $10000 \leq P < 50000$ ✓**

undefined. $10000 < P \leq 50000$

undefined. $10000 \leq P \leq 50000$

**undefined. $10000 < P < 50000$ ✓**

The inequalities that represent this scenario are $10000 \leq P < 50000$ and $10000 < P < 50000$.

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

**An example could be a projectile motion problem where the height is modeled by a quadratic inequality.**

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