

5 5 Practice Inequalities Involving Absolute Value

****Mastering 5 5 Practice Inequalities Involving Absolute Value: A Helpful Guide**** **5 5 practice inequalities involving absolute value** are an excellent way to sharpen your skills in algebra and better understand how absolute value functions behave within inequalities. Whether you're preparing for exams or just want to strengthen your grasp on the concept, working through these practice problems can build confidence and deepen your comprehension. Absolute value inequalities often pop up in math classes and standardized tests, so getting comfortable with them is a smart move. In this article, we'll explore how to effectively solve absolute value inequalities, break down common types, and provide plenty of practice examples centered around the concept of 5 5 practice inequalities involving absolute value. Along the way, you'll pick up tips, tricks, and insights that make these problems more approachable.

Understanding the Basics of Absolute

Value Inequalities

Before diving into specific practice problems, it's crucial to understand what absolute value represents. The absolute value of a number, denoted $|x|$, refers to its distance from zero on the number line — always a non-negative number. For example, $|3| = 3$ and $|-3| = 3$. When absolute value appears in inequalities, it adds a layer of complexity because the expression inside the absolute value can be positive or negative, but the distance itself is always positive or zero.

Common Forms of Absolute Value Inequalities

There are generally two main types of absolute value inequalities:

1. $|x| < a$ (less than) This means the distance from zero is less than a certain positive number, so x lies between $-a$ and a .
2. $|x| > a$ (greater than) This means the distance from zero is greater than a positive number, so x lies outside the interval $(-a, a)$. In both cases, ' a ' must be positive for the inequality to make sense.

How to Approach 5.5 Practice Inequalities Involving Absolute Value

When you encounter 5.5 practice inequalities involving absolute value, such as $|x - 5| < 5$ or $|2x + 3| \geq 5$, there are systematic

steps to solve them: 1. **Isolate the absolute value expression:** Make sure the absolute value term is by itself on one side of the inequality. 2. **Consider the inequality type:** Is it less than or greater than? 3. **Split the inequality:** - For $|A| < B$, rewrite as $-B < A < B$. - For $|A| > B$, rewrite as $A < -B$ or $A > B$. 4. **Solve the resulting inequalities:** Treat them as normal linear inequalities. 5. **Check the domain and any extraneous solutions:** Sometimes, the solution set needs refining. Practicing these steps with varied examples will prepare you for more complex absolute value problems.

5 5 Practice Inequalities Involving Absolute Value: Example Problems

Here are five carefully selected practice inequalities involving absolute value to work through. Each one highlights different aspects or variations of solving such inequalities.

1. Solve $|x - 5| < 5$

This is a straightforward example of the less-than type. Rewrite as: $-5 < x - 5 < 5$ Add 5 to all parts: $0 < x < 10$ So, the solution set is all x between 0 and 10, not including the endpoints.

2. Solve $|2x + 1| \geq 5$

For greater-than or equal to inequalities, split the expression: $2x$

$+ 1 \leq -5$ or $2x + 1 \geq 5$ Solve each: $2x \leq -6 \rightarrow x \leq -3$ $2x \geq 4 \rightarrow x \geq 2$ Therefore, $x \leq -3$ or $x \geq 2$.

3. Solve $|3x - 2| < 7$

Rewrite: $-7 < 3x - 2 < 7$ Add 2: $-5 < 3x < 9$ Divide by 3: $-5/3 < x < 3$ So, x is between $-5/3$ and 3 .

4. Solve $|x + 4| > 2$

Rewrite: $x + 4 < -2$ or $x + 4 > 2$ Solve: $x < -6$ or $x > -2$

5. Solve $|5 - 2x| \leq 5$

Rewrite: $-5 \leq 5 - 2x \leq 5$ Subtract 5: $-10 \leq -2x \leq 0$ Divide by -2 (remember to flip inequality signs): $5 \geq x \geq 0$ Which means: $0 \leq x \leq 5$

Tips for Mastering Absolute Value Inequalities

While working on 5 practice inequalities involving absolute value, there are a few handy tips to keep in mind: - **Always consider the sign change when dividing by a negative number.**

This is a common mistake that leads to wrong solutions. -

Check your final solution by plugging values back into the original inequality. This verification step prevents errors. -

Visualize the absolute value as distance on the number line.

This can make interpreting inequalities more intuitive. -

****Understand the difference between “less than” and “greater than” absolute value inequalities.**** They yield very different solution sets (intervals inside or outside a range). - ****Practice with a variety of problems, including those with coefficients inside the absolute value.**** This builds flexibility.

Expanding Your Practice: Real-World Application and Advanced Problems

Absolute value inequalities aren't just abstract algebraic concepts; they have real-world applications in fields such as engineering, physics, and economics. For example, absolute value inequalities can represent tolerance levels in manufacturing — ensuring a measurement stays within a certain range from a target value. To further challenge yourself beyond the 5 5 practice inequalities involving absolute value, consider problems involving compound inequalities or absolute value expressions on both sides of the inequality. For example: - Solve $|x - 3| + |x + 1| \leq 5$ - Solve $|2x - 7| > |x + 4|$ These problems require you to think critically about which intervals satisfy the conditions and can deepen your understanding of absolute value behavior. Working through 5 5 practice inequalities involving absolute value is a fantastic way to build confidence and mastery in algebraic problem-solving. With consistent practice and attention to the nuances of inequality

rules, absolute value problems become less intimidating and more manageable — opening doors to success in mathematics and beyond.

5 5 Practice Inequalities Involving Absolute Value: A Comprehensive Mastery Guide

Absolute value inequalities are foundational constructs in advanced algebra and mathematical reasoning, serving as critical tools for modeling precision, uncertainty, and bounded behavior across scientific, engineering, and financial domains. This article delivers an ultra-deep, authoritative exploration of five core practice inequalities involving absolute values, combining rigorous mathematical foundations with practical applications, strategic problem-solving frameworks, and expert insights. Designed to dominate search intent for high-impact educational and technical audiences, this guide transcends basic explanations—delivering comprehensive depth, real-world relevance, and actionable mastery.

Introduction: The Ubiquity and Power of Absolute Value Inequalities

Absolute value, denoted $|x|$, represents the non-negative

magnitude of a real number regardless of sign. Its inequalities formalize conditions where magnitude—rather than sign—determines validity, enabling precise constraints in equations and real-world modeling. From signal processing to risk assessment, absolute value inequalities define boundaries within which values must remain, ensuring system stability, accuracy, and safety. Mastery of these inequalities is indispensable for students, researchers, engineers, and data scientists alike.

This article dissects five pivotal practice problems involving absolute values, each illustrating distinct mechanisms and solution strategies. Beyond step-by-step solutions, we examine the mathematical logic, historical evolution of the concept, comparative effectiveness across variations, and modern applications. By integrating semantic depth, contextual nuance, and expert strategic frameworks, this guide positions readers not merely to solve inequalities—but to architect robust mathematical models grounded in absolute value principles.

1. The Core Inequality: $|x| < a$ – When Magnitude Must Stay Below Threshold

At its essence, $|x| < a$ (for $a > 0$) asserts that the distance of x from zero remains strictly less than a . This inequality defines a bounded interval symmetric about zero: $-a < x < a$. Its solution structure is intuitive but requires precision in handling strict

inequality versus non-strict bounds—a nuance often misunderstood.

Solving $|x| < a$ yields the open interval $(-a, a)$, reflecting all real numbers whose distance from zero is less than a . The strict inequality excludes endpoints, distinguishing it from $|x| \leq a$, which yields $[-a, a]$. This distinction has profound implications in optimization and feasibility analysis.

For example, in control systems, a feedback loop may require actuator output $|u(t)| < 5$ volts to prevent damage—any deviation beyond threshold risks system failure. Here, the inequality models a hard safety bound. Similarly, in statistical error margins, $|\text{observed} - \text{true}| < \varepsilon$ ensures results stay within acceptable precision.

Common pitfalls include misinterpreting strict vs. non-strict inequalities and improperly handling domain restrictions. Advanced solvers verify boundary exclusions and apply algebraic symmetry: if $a > 0$, the solution is always centered at zero; if $a \leq 0$, the inequality has no solution. This logical rigor ensures correctness in high-stakes applications.

2. The Dual Bound: $|x| \leq a$ Excludes the Endpoints – Precision in Feasibility

$|x| \leq a$ ($a > 0$) defines a closed interval $[-a, a]$, capturing all x values within a fixed distance of zero. Unlike $|x| < a$, this

inequality permits endpoints, essential in tolerance engineering and physical constraints where exact equality is permissible.

Solving $|x| \leq a$ yields the closed interval $[-a, a]$, a critical boundary in applications such as manufacturing tolerances, where components must fit within $\pm a$ millimeters of nominal size. The closed nature ensures inclusivity—vital for compliance and safety standards.

Consider a precision machining process: part diameter must satisfy $|d - 10| \leq 0.2 \rightarrow 9.8 \leq d \leq 10.2$ mm. Here, endpoint inclusion ensures the part remains within defined operational limits. In contrast, $|d - 10| < 0.2$ would exclude 9.8 and 10.2, potentially violating fit requirements.

Strategic use of $[-a, a]$ preserves continuity and avoids artificial gaps—essential in modeling physical systems where abrupt jumps violate conservation laws. Advanced practitioners leverage this structure in optimization, where feasible regions defined by inequalities shape solution boundaries.

3. The Opposite Side: $|x| > a$ – When Magnitude Exceeds Critical Limits

$|x| > a$ ($a > 0$) defines two disjoint intervals: $x < -a$ or $x > a$. This inequality captures scenarios where deviations beyond a threshold trigger alerts, failures, or opportunities—modeling extremes in risk and performance.

Solving $|x| > a$ yields $x \in (-\infty, -a) \cup (a, \infty)$, a union of two open intervals. This reflects a system where values far from zero demand intervention—e.g., voltage surges exceeding 110% in power grids or credit scores below 580 triggering loan denial.

In network security, packet loss $|L| > 5\%$ may initiate firewall lockdowns, as prolonged excess loss compromises data integrity. Similarly, in finance, $|\text{portfolio_return}| > 15\%$ signals high-risk behavior beyond acceptable volatility thresholds.

Advanced analysis considers asymmetric bounds: $|x| > a$ with $a \neq 0$ creates dual exclusion zones, while bounded versions like $|x| > a$

5 5 Practice Inequalities Involving Absolute Value: A Detailed Examination **5 5 practice inequalities involving absolute value** represent a fundamental aspect of algebra that challenges students and professionals alike to understand the behavior of expressions constrained by magnitude rather than sign. Absolute value inequalities are pivotal in various mathematical fields, including calculus, optimization, and real-world applications such as engineering and physics. This article delves into the intricacies of these inequalities, offering insights into their structure, solution methods, and practical relevance. Understanding absolute value inequalities requires a grasp of the absolute value function itself, which measures the distance of a number from zero on the real number line without regard to direction. When inequalities involve absolute values, they often

describe regions or intervals where the variable satisfies certain distance constraints. The phrase “5 5 practice inequalities involving absolute value” alludes to a series of carefully selected problems that test one’s ability to manipulate and solve these expressions effectively.

Exploring the Nature of Absolute Value Inequalities

To appreciate the complexity of 5 5 practice inequalities involving absolute value, it is essential to start with their general form. Typically, an absolute value inequality can be expressed as $|x| < a$ or $|x| > a$, where “a” is a positive constant. These forms split into two distinct linear inequalities when solved without the absolute value symbol. For example, the inequality $|x| < 5$ translates into the compound inequality $-5 < x < 5$, which describes all x-values within five units of zero. Conversely, $|x| > 5$ breaks down into $x < -5$ or $x > 5$, representing values beyond five units from zero in either direction. The 5 5 practice inequalities involving absolute value often extend these basics by incorporating variables on both sides, different constants, or more complex expressions inside the absolute value.

Common Types of Absolute Value

Inequalities in Practice

Within the scope of 5 5 practice inequalities involving absolute value, several categories frequently appear:

1. **Simple inequalities:** Such as $|x| \leq 3$, which require straightforward interval determination.
2. **Compound inequalities:** For example, $|2x - 1| < 7$, where the expression inside the absolute value is linear and demands additional algebraic steps.
3. **Inequalities with variables on both sides:** Cases like $|x - 2| \geq |3x + 1|$, which involve comparing magnitudes and often necessitate case analysis.
4. **Inequalities involving absolute value combined with other functions:** Such as $|x + 4| + 3 > 10$, requiring isolation of the absolute value term before solving.
5. **Nested absolute value inequalities:** More complex forms like $||x| - 3| < 2$, testing deeper understanding of absolute value properties.

These variations underscore why consistent practice with multiple examples, such as 5 5 practice inequalities involving absolute value, is crucial for mastery.

Analytical Techniques for Solving

Absolute Value Inequalities

The process of solving absolute value inequalities hinges on recognizing the definition of absolute value and applying it to split the inequality into solvable parts. The central analytical approach involves rewriting the absolute value inequality without the absolute value symbol by considering the positive and negative scenarios. For instance, given $|x + 1| \leq 4$, the inequality can be rewritten as: $-4 \leq x + 1 \leq 4$ This compound inequality is then solved by subtracting 1 from all parts: $-5 \leq x \leq 3$ This technique is standard in 5 5 practice inequalities involving absolute value and forms the backbone of many solution strategies.

Case Study: Solving $|3x - 2| > 7$

To illustrate, consider the inequality $|3x - 2| > 7$. The absolute value greater-than form divides into two separate inequalities: $3x - 2 > 7$ or $3x - 2 < -7$ Solving both: 1. $3x > 9 \rightarrow x > 3$ 2. $3x < -5 \rightarrow x < -5/3$ Thus, the solution set is $x < -5/3$ or $x > 3$, representing values where the expression inside the absolute value exceeds 7 in magnitude. This example typifies the approach required in 5 5 practice inequalities involving absolute value and highlights the importance of understanding inequality signs and solution sets.

Applications and Relevance of Absolute Value Inequalities

Beyond their theoretical appeal, 5 5 practice inequalities involving absolute value have significant practical applications. In engineering, they help define tolerances and error margins, ensuring systems operate within safe limits. For example, an inequality such as $|\text{measurement} - \text{target}| \leq \text{tolerance}$ can determine acceptable variations in manufacturing. In data science and statistics, absolute value inequalities underpin concepts like median absolute deviation (MAD), a robust measure of variability that accounts for the distance of data points from a central value. Optimization problems often employ absolute value inequalities to model constraints where deviations must be limited. Moreover, absolute value inequalities appear in programming algorithms for error checking and boundary conditions, making their mastery vital for professionals in computational fields.

Pros and Cons of Relying on Absolute Value Inequalities in Problem Solving

1. Pros:

1. Provide clear boundaries for variable constraints in diverse contexts.
2. Allow modeling of symmetric conditions around a central

point.

3. Facilitate solving complex real-world problems involving deviations and tolerances.

2. **Cons:**

1. May lead to more complicated piecewise or case-based solutions.
2. Sometimes require careful interpretation to avoid errors in inequalities' signs.
3. Can be challenging for beginners due to the dual nature of absolute value expressions.

Understanding these advantages and limitations is crucial when tackling 5 5 practice inequalities involving absolute value, especially in academic or professional settings.

Enhancing Mastery Through Targeted Practice

Given the multifaceted nature of absolute value inequalities, engaging with diverse problems is essential. The phrase “5 5 practice inequalities involving absolute value” suggests a structured approach: practicing sets of five problems across five different categories or difficulty levels. This method ensures comprehensive coverage and gradual skill enhancement. Students and educators might consider organizing practice sessions around:

1. Basic interval inequalities involving absolute value.
2. Linear expressions inside absolute values with simple constants.
3. Compound inequalities with variables on both sides.
4. Absolute value inequalities combined with additional arithmetic operations.
5. Advanced or nested absolute value inequalities requiring multi-step reasoning.

This framework helps maintain focus while exposing learners to a broad spectrum of scenarios, increasing both confidence and competence.

Integrating Technology and Tools in Practice

Modern tools such as graphing calculators and algebraic software (e.g., Desmos, GeoGebra, Wolfram Alpha) can enhance the understanding of absolute value inequalities. Visualizing the solution sets graphically often clarifies the intervals and regions satisfying the inequalities. When working through 5.5 practice inequalities involving absolute value, incorporating these technologies can provide immediate feedback and deepen conceptual insights. For example, plotting $y = |x - 4|$ and $y = 3$ allows users to visually identify where the inequality $|x - 4| \leq 3$ holds true, corresponding to x -values between 1 and 7. Such visualizations complement algebraic solutions and cater to diverse learning styles. Mastering 5.5

practice inequalities involving absolute value demands a balanced combination of theoretical knowledge, strategic problem-solving, and consistent practice. By dissecting the fundamental principles, exploring varied problem types, and leveraging technological aids, learners can develop a robust understanding of these essential mathematical constructs. This foundation not only aids academic success but also equips individuals to apply absolute value inequalities effectively across scientific and engineering domains.

Most people do not set out with the intention of downloading a book. Usually, it starts with a small need. A question that lingers longer than expected, a topic that keeps appearing in conversations, or a moment when surface-level information simply is not enough. That is often when 5 5 Practice Inequalities Involving Absolute Value enters the picture.

At first, the goal might be modest. Read a chapter. Find one useful explanation. Move on. But having the book available in PDF format quietly changes that intention. There is no rush to finish, no pressure to read everything at once. The book sits there, ready, waiting for attention.

Reading begins to happen in fragments. A few pages in the morning while the day is still quiet. A bookmarked section checked again in the afternoon. A highlighted paragraph revisited at night because it suddenly makes more sense.

These moments do not feel like formal study. They feel natural.

The layout remains familiar every time the file is opened. Pages look the same, headings stay where they were, and visual cues help the mind remember. Over time, readers stop searching and start navigating instinctively.

Notes appear almost without effort. A sentence stands out, so it gets highlighted. A thought forms, so it gets written in the margin. Weeks later, those notes feel like messages left behind by an earlier version of the reader.

Search tools quietly save time. Instead of flipping through pages or scrolling endlessly, one keyword brings clarity. It turns the book into something useful long after the first read.

There is also a sense of relief in knowing the source is trustworthy. When a book comes from a reliable platform, attention stays on understanding, not on questioning accuracy or safety.

For students, this kind of access feels stabilizing. Materials are always there, even when schedules are chaotic. Studying becomes less about urgency and more about familiarity.

Professionals experience it differently. Certain sections become

references. Others gain meaning only after real-world experience catches up. The book grows alongside the reader.

Independent learners often appreciate the absence of structure. There is no deadline, no checklist. Progress happens when curiosity returns, not when it is demanded.

Accessibility options quietly matter. Adjusting text size, using reading tools, or switching devices makes the experience more comfortable without drawing attention to itself.

Files stay organized. Even after months, returning does not feel like starting over. The content feels known, not overwhelming.

What stands out over time is how the relationship changes. 5 5 Practice Inequalities Involving Absolute Value stops feeling like a file that was downloaded. It becomes something familiar, something useful in quiet ways.

Sometimes, a passage read long ago suddenly feels relevant. A concept that once seemed abstract now makes sense. Growth shows itself in these small moments.

Reading no longer feels like an obligation. It becomes something to return to when clarity is needed or curiosity resurfaces.

In this way, learning slips into everyday life without announcement. The book does not demand attention. It simply remains available.

And often, that quiet availability is what makes it valuable. Knowledge does not have to be chased when it is already close at hand.

Five 5-Practice Inequalities Involving Absolute Value: A Global Systemic Lens

The absolute value function, defined for any real number x as $|x| = \min(x, -x)$, is deceptively simple in form but profoundly complex in consequence. Beyond its elementary role in mathematics, absolute value underpins a hidden architecture of inequality—particularly in five structurally interwoven domains where precision, fairness, and representation are contested. These five practice inequalities—rooted in formal definition yet echoing across economics, law, technology, and social policy—reveal how mathematical abstraction becomes a battleground for power, risk, and systemic bias. This analysis traces their origins, interrogates their evolution, contextualizes their geopolitical and economic embedding, examines industry impact, weighs expert dissent, confronts controversies, and projects long-term implications.

The Mathematical Core: Absolute Value as a Binary Threshold

Absolute value, at its core, is a function of binary classification: it maps every real number to its non-negative magnitude, collapsing sign into distance from zero. This seemingly neutral operation encodes asymmetry: $(|a - b| < |c - d|)$ does not compare magnitudes directly but evaluates relative deviation. When extended into inequalities—especially in sequences or patterns—the function becomes a scalpel for measuring deviation, error, or deviation from norm. The five practice inequalities that emerge are not merely mathematical constructs but cognitive frameworks: they codify how societies define acceptable variation, deviation, and risk. Mathematically, consider the canonical trio: 1. $(|x| \geq 0)$ for all $(x \in \mathbb{R})$ — non-negativity. 2. $(|x - \mu| \leq \sigma)$ — deviation within standard error. 3. $(|x - a| < |x - b|)$ — proximity to a reference point. 4. $(|x_1 + x_2| \leq |x_1| + |x_2|)$ — triangle inequality. 5. $(\max(|a_i|) \geq \frac{1}{n} \sum_{i=1}^n |a_i|)$ — divergence from mean. These are not isolated truths but interdependent nodes in a logical lattice. Their formal consistency masks profound asymmetries when applied in real-world systems—especially where inequality reflects systemic disadvantage, not neutral variation.

Origins and Evolution: From Euclid to Algorithmic Governance

The conceptual roots of absolute deviation stretch to ancient geometry—Euclid's postulates implicitly relied on distance. But the formal absolute value emerged in the 19th century, crystallized in the work of Karl Weierstrass and Georg Cantor. Cantor's set theory formalized distance as a foundational metric, enabling $\lvert x - y \rvert$ as a universal language for proximity. By the 20th century, the triangle inequality became axiomatic in normed vector spaces, later embedded in digital infrastructure. The "five inequalities" crystallized not in a single moment but through cumulative practice across disciplines. In statistics, the triangle inequality underpinned error propagation. In electrical engineering, it governed signal integrity. In finance, it shaped risk models. By the 1980s, computational systems increasingly operationalized these principles—leading to automated inequality checks in software, yet also amplifying hidden biases when assumptions were violated. Geopolitically, the spread of these practices mirrored Western scientific hegemony. Post-WWII, U.S.-led institutions standardized mathematical education globally, exporting not just pedagogy but a normative framework where deviation measured efficiency and deviation from norms equated to dysfunction. Yet this universality obscured cultural and contextual variation—particularly in non-Western epistemologies where relationality and balance often superseded linear distance.

Geopolitical and Economic Context: The Absolute Value as a Governance Tool

Absolute value inequalities are not abstract—they are instruments of governance. In macroeconomic policy, the standard deviation $\sigma = \sqrt{\frac{1}{n} \sum (x_i - \mu)^2}$, derived from $|x_i - \mu|$, quantifies economic volatility. Central banks use such metrics to define acceptable inflation ranges, yet the choice of μ —the target—embeds political judgment: is stability relative to growth, equity, or control? The inequality $\sigma < \epsilon$ becomes a mandate, masking trade-offs between growth and risk tolerance. In financial markets, the Black-Scholes model relies on $|S_t - S_0|$ to define option risk thresholds

Questions & Answers About 5 5 practice inequalities involving absolute value

No	Question	Answer
1	What is the general approach to solving absolute value inequalities like $ x - 5 < 5$?	To solve $ x - 5 < 5$, rewrite it as a compound inequality: $-5 < x - 5 < 5$. Then, solve for x by adding 5 to all parts, resulting in $0 < x < 10$.

2	How do you solve the inequality $ 2x + 3 \geq 5$?	Split the inequality into two cases: $2x + 3 \geq 5$ or $2x + 3 \leq -5$. Solve each: $2x \geq 2 \Rightarrow x \geq 1$, and $2x \leq -8 \Rightarrow x \leq -4$. So, the solution is $x \leq -4$ or $x \geq 1$.
3	Can you explain how to graph the solution of $ x - 4 \leq 3$ on a number line?	Rewrite as $-3 \leq x - 4 \leq 3$, which gives $1 \leq x \leq 7$. On the number line, shade the region between 1 and 7, including endpoints.
4	What does the inequality $ x > 7$ represent in terms of intervals?	It represents all x such that the distance from zero is greater than 7, or $x < -7$ or $x > 7$.
5	How do you solve $ 3x - 2 < 4$?	Rewrite as $-4 < 3x - 2 < 4$. Add 2: $-2 < 3x < 6$. Divide by 3: $-2/3 < x < 2$.
6	What is the solution set for the inequality $ x + 1 \geq 0$?	Since absolute value is always non-negative, $ x + 1 \geq 0$ is true for all real numbers. So, the solution is all real numbers.
7	How to solve $ x - 3 > 0$?	The inequality $ x - 3 > 0$ means x is any number except 3, since the absolute value is zero only when $x = 3$.
8	What is the difference between solving $ x < a$ and $ x > a$, where $a > 0$?	$ x < a$ means x is within a distance a from 0, so $-a < x < a$. $ x > a$ means x is more than a units away from 0, so $x < -a$ or $x > a$.
9	How do you express the solution to $ x - 2 \leq 6$ in interval notation?	Rewrite as $-6 \leq x - 2 \leq 6$, so $-4 \leq x \leq 8$. In interval notation, the solution is $[-4, 8]$.

10	What steps do you take to solve the compound inequality $ x + 4 < 2x$?	Because the right side involves x , first consider the domain where $2x > 0 \Rightarrow x > 0$. Then solve $ x + 4 < 2x$ by splitting into cases and checking domain constraints. For $x > 0$, solve $x + 4 < 2x$ and $-(x + 4) < 2x$, leading to $x > 4$ and $x > -4$ respectively. Considering $x > 0$, the solution is $x > 4$.
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absolute value inequalities, solving absolute value equations, graphing absolute value inequalities, compound inequalities, absolute value expressions, linear inequalities, inequality practice problems, absolute value properties, inequality word problems, absolute value number line

Understanding 5 5

Practice Inequalities

Involving Absolute Value

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