

Absolute value equations and inequalities pacific

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Understanding Absolute Value Inequalities**

What is the Absolute Value Inequality Formula?

An absolute value inequality takes the form $|x| < a$ or $|x| > a$, where a is a positive constant.

How to Find an Absolute Value Inequality from a Number Line:

- Identify the numbers on the number line where the inequality holds.
- For $|x| < a$, these numbers are within a units of 0.
- For $|x| > a$, these numbers are more than a units away from 0.

How to Solve Modulus Inequalities:

Modulus inequalities are absolute value inequalities. To solve them:

- **Isolating the absolute value:** Get the absolute value term on one side of the inequality sign.
- **Case Analysis:** Consider two cases: x is positive and x is negative. Solve for x in each case.
- **Combine Solutions:** The solutions from both cases are the solution set of the inequality.

The Absolute Value in Algebra 2

The absolute value in Algebra 2 represents the distance of a number from 0 on the number line. It ensures that expressions involving numbers remain positive.

Solving Absolute Value Equations:

To solve absolute value equations, isolate the absolute value and solve for x:

- $|x| = a$: $x = a$ or $x = -a$
- $|x + b| = c$: $x = c - b$ or $x = -c - b$

Solving Inequality Equations:

Inequality equations involve inequalities with one or more variables. To solve them, isolate the variable on one side of the inequality sign.

Solving Absolute Value Inequalities with Fractions:

To solve absolute value inequalities with fractions, clear the fraction and apply the usual steps for solving absolute value inequalities.

Simplifying Absolute Value:

- $|x| = 0$ if and only if $x = 0$
- $|x| = x$ if $x \geq 0$
- $|x| = -x$ if $x < 0$

Solving Inequalities with Two Variables:

To solve inequalities with two variables, isolate one variable and solve for it in terms of the other. Then, represent the solution set on a graph.

The Absolute Value Theorem Formula:

$|x - c| < a$ if and only if $c - a < x < c + a$

Equality of Absolute Value:

- $|x| = |y|$ if and only if $x = y$ or $x = -y$
- $|-x| = |x|$ for all x

Finding Absolute Value Inequality from a Word Problem:

- Translate the word problem into a mathematical inequality.
- Determine the absolute value of the relevant variable.
- Use the absolute value inequality formula to express the statement mathematically.

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