Equations and Inequalities

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Pre-Calculus Mathematics for Business and Economics

Sub-Topics

1. Compound linear equation and interval theory
2. Absolute value inequalities on the number line
3. Algebraic symbol manipulation 2
4. Equations with multiple or no solutions
5. Solve an absolute value equation

Interval and Set Notation

Symbol	English Expression	Meaning
()	Open Brackets	Set excludes end points
[]	Closed Brackets	Set includes end points
$\varnothing$	The Null Set	Contains nothing - empty
$\in$	"is an element of" or "in"	the preceding is in the set
And	And	Both need to be true
Or	Or	At least one is true

Example: $x \in [4, \infty)$

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Example: $v \in (-5, -2]$

Interval Notation and Inequalities: Write the solution in interval notation.

$$3x + 6 < 24 \quad \text{or} \quad 2x - 2 \leq -8$$

Absolute value inequalities on the number line: Graph the solution to the inequality on the (real) number line.

$|x + 3| < 4$

Algebraic Symbol Manipulation: Solve the following equation for y_2.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Equations with multiple, unique or no solutions

For each equation, choose the statement that describes its solution. If applicable, give the solution. <u>Possible Answers</u>:

1. The given equation is a contradiction (ie. $0 = 4$). There is no solution.

2. The given equation is a linear equation. There is exactly one solution (ie. $x = 2$).

3. The given equation is an identity (ie. $0 = 0$). All real numbers are solutions.

Equations with multiple, unique or no solutions: for each equation, choose the statement that describes its solution. If applicable, give the solution.

$$4(w-1)-1 = 2(2w-3) \qquad\qquad 4(x+1)+x = 3(x-2)+2$$

Solve an absolute value equation: If there is more than one solution, separate them with commas. If there is no solution, click on "no solution."

$2|u| = -4$