

Objective 4 - 8

Solve a 1-variable compound inequality

Vocab:

Compound inequality: is a combination of two or more **inequalities** joined by either an 'and' or an 'or.'

PROBLEM

Solve: $-5(x - 15) < -25$ or $-4(x - 2) > -20$

STEP 1

Determine the solution for the first inequality.

$$-5(x - 15) < -25$$

$$-5x - 5(-15) < -25$$

Apply the distributive property to the left side of the inequality.

$$-5x + 75 < -25$$

$$-5x + 75 - 75 < -25 - 75$$

Subtract 75 from both sides of the inequality.

$$-5x < -100$$

$$\frac{-5x}{-5} > \frac{-100}{-5}$$

Divide both sides of the inequality by -5 . Remember to reverse the inequality symbol when dividing by a negative number.

$$x > 20$$

STEP 2

Determine the solution for the second inequality.

$$-4(x - 2) < -20$$

$$-4x - 4(-2) < -20$$

Apply the distributive property to the left side of the inequality.

$$-4x + 8 < -20$$

$$-4x + 8 - 8 < -20 - 8$$

Subtract 8 from both sides of the inequality

$$-4x < -28$$

$$\frac{-4x}{-4} > \frac{-28}{-4}$$

Divide both sides of the inequality by -4 . Remember to reverse the inequality when dividing by a negative number.

$$x > 7$$

ANSWER

$x > 20$ or $x < 7$

Guided Practice: Solve and Graph

$$2 < x + 5 < 9$$

$$-5 \leq -x - 3 \leq 2$$

$$2x + 3 < 9 \text{ or } 3x - 6 > 12$$

Practice: Solve and Graph

1. $-14 < x - 8 < -1$

2. $-1 \leq -5t + 2 \leq 4$

3. $3h + 1 < -5$ or $2h - 5 > 7$

4. $4c + 1 \leq -3$ or $5c - 3 > 17$

Additional Help:

https://www.khanacademy.org/math/algebra/linear_inequalities/compound_absolute_value_inequali/v/compound-inequalities

<http://www.mathplanet.com/education/algebra-1/linear-inequalitites/solving-compound-inequalities>