Exercise 5

How do you solve an absolute value inequality algebraically?

Solution

Remove the absolute value sign by breaking up the inequality into two; using the logical operators, "and" or "or," if you have $<$ or $>$, respectively; and solving for x. For example,

$$|x - k| \leq h$$

$$x - k \leq h \quad \text{and} \quad x - k \geq -h$$

$$-h \leq x - k \leq h$$

$$-h + k \leq x \leq h + k.$$

Alternatively,

$$|x - k| \geq h$$

$$x - k \geq h \quad \text{or} \quad x - k \leq -h$$

$$x \geq h + k \quad \text{or} \quad x \leq -h + k.$$