

Properties of Inequality

- Addition Property of Inequality

If the same number is added to both sides of an equality, then the solution set to the inequality is unchanged; for instance,

$$\text{if } a < b, \quad \text{then } a + c < b + c.$$

Note: This property holds for inequalities with symbols $<$, \leq , $>$, and \geq .

- Multiplication Property of Inequality

If both sides of an inequality are multiplied by the same non-zero number, the solution set of the inequality is unchanged by keeping the same inequality symbol if the number is positive and reversing the inequality symbol if the number is negative: for instance,

$$\text{if } a < b \quad \text{and} \quad c \neq 0, \quad \text{then} \quad \begin{cases} ac < bc, & \text{if } c > 0 \\ ac > bc, & \text{if } c < 0 \end{cases}$$

Note: This property holds for inequalities with symbols $<$, \leq , $>$, and \geq .