

Concept Check Decide whether each statement is true or false. If it is false, explain why.

- The union of the solution sets of $x + 1 = 6$, $x + 1 < 6$, and $x + 1 > 6$ is $(-\infty, \infty)$.
- The intersection of the sets $\{x|x \geq 9\}$ and $\{x|x \leq 9\}$ is \emptyset .
- The union of the sets $(-\infty, 7)$ and $(7, \infty)$ is $\{7\}$.
- The intersection of the sets $(-\infty, 7]$ and $[7, \infty)$ is $\{7\}$.
- The intersection of the set of rational numbers and the set of irrational numbers is $\{0\}$.
- Let $A = \{1, 2, 3, 4, 5, 6\}$, $B = \{1, 3, 5\}$, $C = \{1, 6\}$, $D = \{4\}$. Specify each set.
 - $B \cap A$
 - $A \cup B$
 - $A \cap D$
 - $B \cap C$
 - $B \cup C \cup D$
 - $A \cap \emptyset$
 - $D \cup \emptyset$
 - $B \setminus C$
 - $C \setminus D$
- Express each set in the simplest interval form.
 - $(-\infty, -1] \cap [-4, \infty)$
 - $(-\infty, -6) \cap [-4, \infty)$
 - $(-\infty, 3) \cup (-\infty, -2)$
 - $[3, 6] \cup (4, 6)$
 - $(-\infty, 5] \cap (-3, \infty)$
 - $(-\infty, 3] \cap [3, \infty)$
 - $(-7, 5] \cap (-\infty, 6)$
 - $(-7, 5] \cup (-\infty, 6)$
 - $[1, 4) \cup (2, 6]$
- For each compound inequality, give the solution set in both interval and graph form.
 - $x + 5 \leq 11$ and $x - 3 \geq -1$
 - $x + 1 > 3$ or $x + 4 < 2$
 - $\begin{cases} 3x - 4 \leq 8 \\ -4x + 1 \geq -15 \end{cases}$
 - $-2 < \frac{1-3x}{-2} < 7$
 - $2 \leq 4 - \frac{1}{2}(x - 8) < 10$
 - $4x + 1 \geq -7$ or $-2x + 3 \geq 5$
 - $x < 5$ or $x < -3$
 - $x < 5$ and $x < -3$
 - $-3x \leq -6$ and $-3x \geq 0$
 - $x + 1 \geq 5$ or $x - 2 < 10$
 - $\frac{7-3x}{5} < -4$ or $\frac{7-3x}{5} > 4$
- Discussion:* If $-x$ is between a and b , then what can you say about x ?
- Discussion:* For which of the inequalities is the notation used correctly?
 - $-2 \leq x < 3$
 - $-4 \geq x < 7$
 - $-1 \leq x > 0$
 - $6 < x \leq -8$
 - $5 \geq x \geq -9$
 - $3 < x < -1$
- The formula $C = \frac{5}{9}(F - 32)$ can be used to convert Fahrenheit temperatures F to Celsius temperatures C . Gold is a liquid for Celsius temperatures C such that $1063^\circ \leq C < 2660^\circ$. Find such an inequality for the corresponding Fahrenheit temperatures.
- State:
 - The set of expenses that are greater than \$10000 for private schools or greater than \$4000 for public schools.
 - The set of expenses that are less than \$10000 for private schools and more than \$4000 for public schools

College Expenses (in Dollars), 4-Year Institutions

Type of Expense	Public Schools (in-state)	Private Schools
Tuition and fees	5950	21,588
Board rates	3402	3993
Dormitory charges	4072	4812

13. Groupwork:

With partner, discuss how you can solve the following inequalities and then solve them.

a) $-4x < 2x - 18 < -x$

b) $7x - 5 \leq 4x - 3 \leq 8x - 3$