ABSOLUTE VALUE INEQUALITIES #4

Directions: Solving absolute value inequalities requires two different strategies. To solve absolute value inequalities with a “greater than” symbol, you should split the problem into two separate inequalities, like solving an absolute value equation. This strategy is demonstrated in Example 1. For inequalities with a “less than” symbol, you can solve the two inequalities at the same time, as shown in Example 2.

Example 1: \[
\begin{align*}
|x + 7| &> 10 \\
7 < x + 7 &< 13 \quad \text{(subtract 7 from both sides)} \\
x &< -10 \quad \text{or} \quad x > 3
\end{align*}
\]

\[
\begin{align*}
|x + 4| &< 10 \\
-10 < x + 4 &< 0 \quad \text{(subtract 4 from each part)} \\
-14 &< x < 6
\end{align*}
\]

1) \[|2x - 5| < 31\]
2) \[|4x + 4| > 20\]
3) \[|2x - 7| \leq 13\]
4) \[|15 - 5x| < 50\]
5) \[\left| \frac{x}{4} - 2 \right| \geq 6\]
6) \[|8x + 24| < 72\]
7) \[|-x + 1| \leq 8\]
8) \[|2x + 6| > 12\]
9) \[|9x - 27| < 18\]