ABSOLUTE VALUE INEQUALITIES #3

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:

\[
\begin{align*}
|x + 7| &> 10 \\
|x + 4| &< 10 \\
\end{align*}
\]

\[
\begin{align*}
x + 7 &< -10 \quad \text{or} \quad x + 7 > 10 \quad \text{(subtract 7 from both sides)} \\
x &< -17 \quad \text{or} \quad x > 3 \\
\hline
-10 &< x + 4 < 10 \quad \text{(subtract 4 from each part)} \\
-14 &< x < 6 \\
\end{align*}
\]

1) \( |2x + 5| < 21 \)  
2) \( |8x + 8| > 40 \)  
3) \( |2x + 7| \leq 13 \)

4) \( |15 + 5x| < 50 \)  
5) \( \left| \frac{x}{4} + 2 \right| \geq 12 \)  
6) \( |4x + 12| < 36 \)

7) \( |x + 1| \leq 19 \)  
8) \( |2x - 6| > 12 \)  
9) \( |9x - 27| < 36 \)

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