Class Practice on Inequalities

1. a. Solve for $x$: $4x + 1 \leq 13$

   b. Show the solution on a number line.

2. a. Solve for $x$: $4x + 1 \leq 2x - 1$

   b. Show the solution on a number line.

3. a. Solve for $x$: $2x - 1 < 5x + 8$

   b. Show the solution on a number line.
1. a. Solve for $x$:

\[
4x + 1 \leq 13
\]

\[
-1 - 1
\]

\[
4x \leq 12 \quad \text{Next, we will divide both sides by } +4.
\]

\[
\frac{4x}{4} \leq \frac{12}{4}
\]

\[
x \leq 3 \quad \leftarrow \text{Answer}
\]

So, the solution is all real numbers that are less than or equal to 3.

b. Show the solution on a number line.

2. a. Solve for $x$:

\[
4x + 1 \leq 2x - 1
\]

\[
-2x \quad -2x
\]

\[
2x + 1 \leq -1
\]

\[
-1 \quad -1
\]

\[
2x \leq -2 \quad \text{Next, we will divide both sides by } +2.
\]

\[
\frac{2x}{2} \leq \frac{-2}{2}
\]

\[
x \leq -1 \quad \leftarrow \text{Answer}
\]

So, the solution is all real numbers that are less than or equal to $-1$.

b. Show the solution on a number line.
3. a. Solve for $x$:

\[
2x - 1 < 5x + 8
\]

\[-5x\]
\[-3x - 1 < 8\]
\[\frac{-3x}{-3} > \frac{9}{-3}\]
\[x > -3 \leftarrow \text{Answer}\]

So, the solution is all real numbers that are greater than $-3$.

b. Show the solution on a number line.