the left (or the right) of $a$.

**Example:**
Show the graph of the solution of the inequality $5(x - 3) > 2x + 9$ on number line.

**Solution:**

\[
5(x - 3) > 2x + 9 \\
\Rightarrow 5x - 15 > 2x + 9 \\
\Rightarrow 5x - 15 - 2x > 2x + 9 - 2x \\
\Rightarrow 3x - 15 > 9 \\
\Rightarrow 3x > 9 + 15 \\
\Rightarrow 3x > 24 \\
\Rightarrow x > 8
\]

Thus, the solution of the given inequality can be represented on the number line as shown below.

- The solution set might be taken from real numbers or whole numbers or integers or any other set of numbers. The set from which the values of the variables (involved in the inequation) are chosen is called the **replacement set**. We may take any set as the replacement set. For example, $\mathbb{N}$, $\mathbb{Z}$, $\{-4, -3, -2\}$ can be taken as the replacement set.

- **Linear inequalities in two variables and representing their solution graphically**

Rules for solving an inequality:

- Equal numbers may be added to or subtracted from both sides of an inequality without affecting the sign of the inequality.
- Both sides of an inequality can be multiplied with or divided by the same positive number. But when both sides are multiplied with or divided by a negative number, the sign of inequality is reversed.

**Example 1:** Solve $3\left(\frac{3}{5}x + 4\right) \geq 2(x - 3)$.

**Solution:**

\[
3\left(\frac{3}{5}x + 4\right) \geq 2(x - 3) \\
\Rightarrow 3\left(\frac{3x + 20}{5}\right) \geq 2(x - 3) \\
\Rightarrow 3(3x + 20) \geq 10(x - 3) \\
\Rightarrow 9x + 60 \geq 10x - 30 \\
\Rightarrow 9x - 10x \geq -30 - 60 \\
\Rightarrow -x \geq -90 \\
\Rightarrow x \leq 90
\]

∴ The solution set of the given inequality is $(-\infty, 90]$. 

\[\]