General direction for the students :-Whatever be the notes provided , everything must be copied in the Maths Copy and then do the Home work in the same Copy.

CHAPTER 4 (LINEAR INEQUATIONS)

Here we are going to discuss the following points.

   i) what is linear inequation in one variable?. ii) How to solve linear inequation ?. iii) How to represent solution of linear inequation on a number line?.

Linear inequation in one variable:-It is a first degree algebraic statement consists of two sides ,connected by inequality signs ($<, >, \geq, \leq$).

eg. $2x + 3 > 7$, $3y - 8 \leq y + 6$

REPLACEMENT SET:- The set in which the values of the variable are chosen is called replacement.

NATURAL NUMBERS (N):-

$$N = \{1, 2, 3, 4, - - - - - - - - - - - -\}$$

WHOLE NUMBERS (W):-

$$W = \{0, 1, 2, 3, - - - - - - - - - - - - - -\}$$

INTEGERS (I or Z):-

$$I \text{ or } Z = \{- - - -, -3, -2, -1, 0, 1, 2, 3 - - - - -\}$$

* Z^+ stands for positive integers , Z^- stands for negative integers

REAL NUMBERS (R):-

All numbers on the number line including Rational and Irrational numbers.

* R^+ stands positive real numbers , R^- stands for negative real numbers.

REPRESENTATION OF SOLUTION SET ON A NUMBER LINE

* **Before writing the solution set Make sure that coefficient of the variable must be positive one. If not make it +1 through proper transformation . You should follow the rules mentioned below.**

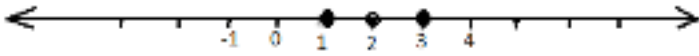* **If** $-x < -b \Rightarrow x > b$

* **If** $-x > -b \Rightarrow x < b$

* If $-x \le b \implies x \ge -b$ **, etc**

eg 1. If $x \le 3$ and $x \, \varepsilon \, N$

Solution set= { 1,2,3}

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eg 2. If $y > 4$, $y \, \varepsilon \, N$

Solution set = { 5 , 6 , 7 , ----------------}

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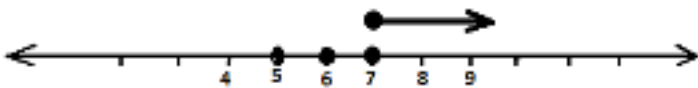
eg 3. If $-x \le 4$, $x \, \varepsilon \, W$

$\implies x \ge -4$, $x \, \varepsilon \, W$

Solution set ={0,1,2,3,------------}

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eg 4. If $-3 \le x < 5$, $x \, \varepsilon \, W$

Solution set={0 , 1 , 2 , 3 , 4}

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eg 5. If $-2 \le x \le 3$, $x \, \varepsilon \, Z$

Solution set={ -2 , -1 , 0 , 1 ,2, 3}

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eg 6. If $-2x < -8$, $x \varepsilon I$

$\Rightarrow 2x > 8$

$\Rightarrow x > 4$, $x \varepsilon I$

Solution set={5 , 6 ,7 ,---------}

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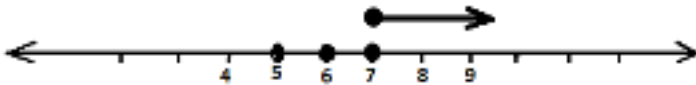
eg 7. If $2 \leq y < 6$, $y \varepsilon R$

Solution set=$\{y : 2 \leq y < 6, \ y \varepsilon R\}$ *Note that, in R solution set is in set builder form.*

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eg 8. If $-3y < 9$, $y \varepsilon R$

$\Rightarrow 3y > -9$

$\Rightarrow y > -3$, $y \varepsilon R$

Solution set=$\{y : y > -3, y \varepsilon R\}$ *Note that , in R solution set is in set builder form.*