Contents

Conventional Method

The solution for a inequality of the form $x+1>0$ conventionally is calculated by considering the following steps:

- Separation of x and constant terms to different hand sides of the equation.
- Evaluation of x on the basis of constant.

$$x > -1$$

  The domain for the inequality is expressed as:

$$x \epsilon (-1, \infty)$$

Wavy Method

- Wavy method is the method of determining the solution of an inequality by plotting critical points of the function in a number line and arranging the critical points in ranges followed by prescription of ranges in alternate signs taking the right most as positive which gives the leftmost a negative range followed by it's evaluation in terms of operator of inequality.

Critical points

- The critical points in a function are those set of real numbers which result the value of the function to yield zero.
- In a function $f(x) = (x-1)$,the critical point is 1 .
- In a function $f(x) = (x-1)(x+1)(x-12)(x+3)x$, the critical points are $1, -1, 12, -3, 0$.

Nature of Infinity

- The solution for an inequality always lies in between :

$$x \epsilon (-\infty, \infty)$$

- The interval for expressing infinity is always open.

- The interval for expressing infinity is always open because there is no any number whose value equal infinity.

Steps of Wavy Method

The steps for solving and inequality using wavy method are:

- **Setup:**
  - List the critical points in the curve.
  - Sketch a number line having range $(-\infty, \infty)$.
  - Plot the critical points of the function in the number line.
  - The number line now has compartments of critical points.
- **Evaluation:**
  - The rightmost compartment b to ∞ is positive $+ve$.
  - The leftmost compartment from a to ∞ is negative $-ve$.
- **Steps for arrangement:**
  - From the rightmost compartment the compartments are assigned alternately the sign of:
    - $-ve| +ve \mid -ve \mid +ve \mid -ve \mid +ve$
- **Possibility of structure of inequality:** The possible structure for inequality are:

$$
\begin{aligned}
f(x) &\geq 0 \\
f(x) &> 0 \\
f(x) &\leq 0 \\
f(x) &< 0
\end{aligned}
$$

Execution

- The solution is the union of intervals that lie under the compartments as demanded by the inequality.
- If $f(x) \geq 0$ then, positive compartments are united.

- The use of open and closed interval is done on the basis of nature of inequality operator among:
  - **Open interval:**
    - $>$
    - $<$
  - **Closed interval:**
    - $\geq$
    - $\leq$

Case of Fraction

In the case of an inequality containing fraction, the following steps are taken in consideration:

- The interval of critical points at the denominator in the union is made open in the side of the critical points.
  - This is done because the function is not defined at these critical points in the denominator.