PRACTICE PAPER

ICSE CLASS 10 – MATHEMATICS

Chapter 4 : Linear Inequations

(in one variable)

Maximum Marks: 40 ***Time allowed: One and a half hours***

1. *Answers to this Paper must be written on the paper provided separately.*
2. *You will not be allowed to write during the first 10 minutes. This time is to be spent in reading the question paper.*
3. ***The time given at the head of this Paper is the time allowed for writing the answers.***
4. *Attempt* ***all*** *questions from* ***Section A*** *and* ***any two*** *questions from* ***Section B****.*
5. ***All working, including rough work, must be clearly shown, and must be done on the same sheet as the rest of the answer.***
6. ***Omission of essential working will result in loss of marks.***
7. *The intended marks for questions or parts of questions are given in brackets [ ].*
8. *N = set of natural numbers, W = set of whole numbers, Z (or I) = set of integers, R = set of real numbers. Number lines should be drawn neatly, with the end-points clearly marked.*

SECTION A (20 Marks)

*(Attempt **all** questions from this Section.)*

Question 1

Choose the correct answers to the questions from the given options. [8]

(Do not copy the question, write the correct answers only.)

(i) If $x \in N$, the solution set of the inequation $3x - 2 < 10$ is:

(a) {1, 2, 3}
(b) {1, 2, 3, 4}
(c) {0, 1, 2, 3}
(d) {4, 5, 6, …}

(ii) If $x \in R$, the solution of the inequation $-2x \geq 8$ is:

(a) $x \geq -4$
(b) $x \leq 4$
(c) $x \leq -4$
(d) $x \geq 4$

(iii) The largest integer x satisfying $5x - 3 < 2x + 10$ is:

(a) 3
(b) 4
(c) 5
(d) 6

(iv) **Assertion (A):** On dividing both sides of the inequation $-4x < 12$ by -4, we get $x < -3$.

Reason (R): When both sides of an inequation are multiplied or divided by the same negative number, the sign of inequality is reversed.

(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true, and (R) is the correct explanation for (A).
(d) Both (A) and (R) are true, but (R) is not the correct explanation for (A).

(v) The graph of the solution set of an inequation on the real number line is shown below. The inequation represented is:



(a) $-2 \leq x < 4$
(b) $-2 < x < 4$
(c) $-2 \leq x \leq 4$
(d) $-2 < x \leq 4$

(vi) If $x \in Z$, the number of elements in the solution set of $-3 < 2x + 1 \leq 7$ is:

(a) 4
(b) 6
(c) 5
(d) 3

(vii) The smallest integer x for which $7 - 3x < 1$ is:

(a) 3
(b) 2
(c) −2
(d) 6

(viii) **Assertion (A):** If $x \in R$, the solution set of $x - 1 > 2$ and $x \leq 6$ is $3 < x \leq 6$.

Reason (R): On the real number line, a hollow circle (○) at 3 shows that 3 is not included in the graph of $x > 3$.

(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true, and (R) is the correct explanation for (A).
(d) Both (A) and (R) are true, but (R) is not the correct explanation for (A).

Question 2

(i) Solve the inequation $7 - 2(x - 3) > 3x - 12$ and write the solution set when: [4]

(a) $x \in N$
(b) $x \in W$
(c) $x \in R$

(ii) Solve the inequation $-7 < 3x - 4 \leq 11$, where $x \in R$. Write the solution set and represent it on a number line. [4]

(iii) Find: [4]

(a) the smallest integer x which satisfies $7 - (2x/3) < 3 - (x/6)$.
(b) the largest integer y which satisfies $(3y + 1)/4 - (y - 2)/3 \leq 2$.

SECTION B (20 Marks)

*(Attempt **any two** questions from this Section.)*

Question 3

(i) Solve the inequation $3x - 4 < x + 6 \leq 2x + 9$, where $x \in Z$. List the solution set. [3]

(ii) Solve the inequation $-2\frac{1}{2} < x/2 - \frac{1}{4} \leq \frac{3}{4}$, where $x \in Z$. List the elements of the solution set. [3]

(iii) Given $P = \{x : 5x - 3 \leq 3x + 7, x \in R\}$ and $Q = \{x : 4x + 1 > 2x - 5, x \in R\}$. [4]

(a) Represent P on a number line.

(b) Represent Q on a number line.

(c) Find $P \cap Q$ and represent it on a number line.

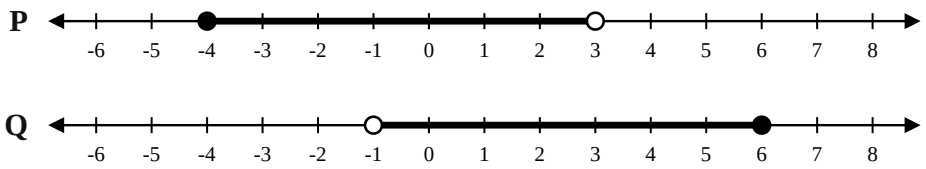
(d) Find $P' \cap Q$ (that is, $Q - P$) and write it in the form of an inequation.

Question 4

(i) Solve the following inequations and represent the common solution on a number line: $3(x - 2) \geq 5x - 14$ and $2x + 3 > -1$, where $x \in R$. [3]

(ii) Solve $4 - 3x \geq 13$ or $2x - 3 > 7$, where $x \in R$. Represent the solution set on a number line. [3]

(iii) The number lines below represent the solution sets P and Q of two inequations, where $x \in R$. [4]



(a) Write P and Q in set-builder form.

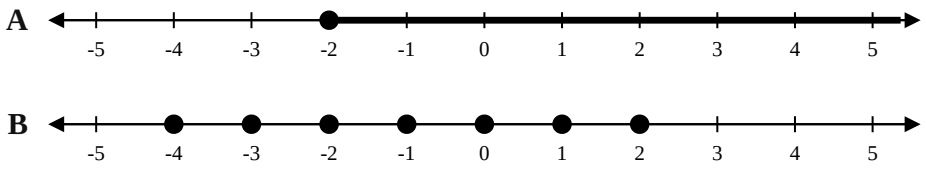
(b) Find $P \cap Q$ and represent it on a number line.

(c) Find $P \cup Q$ and represent it on a number line.

(d) Find $P - Q$ and represent it on a number line.

Question 5

(i) The number lines below represent the sets A and B. [3]



(a) Write A and B in set-builder form ($B \subset Z$).

(b) List the elements of $A \cap B$.

(ii) Solve $(2x + 3)/5 - (x - 1)/2 \leq 1$, where $x \in R$. Represent the solution on a number line. [3]

(iii) Solve $-3 \leq 2x - 1 < 7$ and represent the solution set on three separate number lines when: [4]

(a) $x \in W$

(b) $x \in Z$

(c) $x \in R$

Question 6

(i) Solve $-3 < 5 - 2x \leq 9$, where $x \in R$. Represent the solution on a number line. [3]

(ii) Given $A = \{x : -2 \leq 3x + 1 < 16, x \in Z\}$ and $B = \{x : 5x - 7 \geq 2x - 1, x \in Z\}$. Find: [3]

(a) $A \cap B$

(b) $A - B$

(iii) Find the three smallest consecutive natural numbers such that three times the smallest number added to twice the largest number is greater than 40. [4]

— End of Question Paper —