Chapter - 6

ASSIGNMENT

1 Solve $5x - 3 < 3x + 1$

when (i) x is a real number (ii) x is integer number (iii) x is a natural number

2 Solve: $12x < 50$, when

(i) $x \in R$ (ii) $x \in Z$ (iii) $x \in N$

3 Solve: $-4x > 30$, when

(i) $x \in R$ (ii) $x \in Z$ (iii) $x \in N$

4 Write the set of values of x satisfying $|x - 1| \le 3$ and $|x - 1| \ge 1$.

5 Write the number of integral solutions of $\frac{x+2}{x^2+1} > \frac{1}{2}$.

6 Solve the following in equations:

(i) $\frac{2x-3}{4} + 9 \ge 3 + \frac{4x}{3}$ (ii) $\frac{5x-2}{3} - \frac{7x-3}{5} > \frac{x}{4}$

(iii) $\frac{1}{2}\left(\frac{3}{5}x + 4\right) \ge \frac{1}{3}(x-6)$ (iv) $\frac{3(x-2)}{5} \ge \frac{5(2-x)}{3}$

7 Solve the following in equations:

(i) $\frac{1}{x-2} < 0$ (ii) $\frac{x+1}{x+2} \ge 1$

8 Solve the following linear in equations: (i) $\frac{x-3}{x-5} > 0$ (ii) $\frac{x-2}{x+5} > 2$

9 Solve the following in equations: (i) $\frac{2x+4}{x-1} \ge 5$ (ii) $\frac{x+3}{x-2} \le 2$

10 Solve the following inequation: $\frac{6x-5}{4x+1} < 0$

11 Solve the following inequation: $\frac{2x-3}{3x-7} > 0$

12 Solve the following in equations: $\frac{5x-6}{x+6}<1$

13 Solve: $\frac{7x-5}{8x+3}>4$

14 Solve the following system of in equations: $\frac{5x}{4}+\frac{3x}{8}>\frac{39}{8}$; $\frac{2x-1}{12}-\frac{x-1}{3}<\frac{3x+1}{4}$

15 Solve the following system of in equations: $2(2x+3)-10<6(x-2)$; $\frac{2x-3}{4}+6\geq 2+\frac{4x}{3}$

16 Solve the system of in equations: $\frac{x}{2x+1}\geq\frac{1}{4}, \frac{6x}{4x-1}<\frac{1}{2}$

17 Solve : $|3x-2|\leq\frac{1}{2}$

18 Solve the following system of in equations: $|x-1|\leq 5, |x|\geq 2$.

19 Solve: $1\leq|x-2|\leq 3$

20 Solve: $\frac{|x|-1}{|x|-2}\geq 0, x\in R, x\neq\pm 2$

21 Solve : $\frac{|x+3|+x}{x+2}>1$

22 Solve : $\frac{|x-1|}{x+2}<1$

23 Solve the following system of equation in R.

$\frac{2x-3}{4}-2\geq\frac{4x}{3}-6, 2(2x+3)<6(x-2)+10$

24 Solve : $|x-1|+|x-2|+|x-3|\geq 6$

25 The cost and revenue functions of a product are given by C(x) = 2x + 400 and R(x) = 6x+ 20 respectively, where x is the number of items produced by the manufacturer. How many items the manufacturer must sell to realize some profit?

26 In the first four papers each of 100 marks, Rishi got 95,72,73,83 marks. I f he wants an average of greater than or equal to 75 marks and less than 80 marks, find the range of marks he should score in the fifth paper.

27 A manufacturer has 600 litres of a 12% solution of acid. How many litres of a 30% acid

solution must be added to it so that acid content in the resulting mixture will be more than 15% but less than 18 % ?

28 A man wants to cut three lengths from a single piece of board of length 91 cm. The second length is to be 3 cm longer than the shortest and third length is to be twice as long as the shortest. What are the possible lengths for the shortest board if third piece is to be at least 5 cm longer than the second?

29 Find all pairs of consecutive even positive integers, both of which are larger than 5, such that their sum is less than 23.

30 A solution is to be kept between 86° and 95°F. What is the range of temperature in degree Celsius, if the Celsius (C)/Fahrenheit (F) conversion formula is given by , $F = \frac{9}{5}C + 32$.

31 How many litres of water will have to be added to 1125 litres of the 45% solution of acid so that the resulting mixture will contain more than 25% but less than 30% acid content?

32 A solution of 8% boric acid is to be diluted by adding a 2% boric acid solution to it. The resulting mixture is to be more than 4% but less than 6% boric acid. If there are 640 litres of the 8% solution, how many litres of 2% solution will have to be added?

33 The water acidity in a pool is considered normal when the average pH reading of three daily measurements is between 7.2 and 7.8. If the first two pH reading are 7.48 and 7.85, find the range of pH value for the third reading that will result in the acidity level being normal.

34 Solve the following systems of inequations graphically:

(i) $2x + y \geq 8, x + 2y \geq 8, x + y \leq 6$

(ii) $12x + 12y \leq 840, 3x + 6y \leq 300, 8x + 4y \leq 480\ x \geq 0, y \geq 0$

(iii) $x + 2y \leq 40, 3x + y \geq 30, 4x + 3y \geq 60, x \geq 0, y \geq 0$

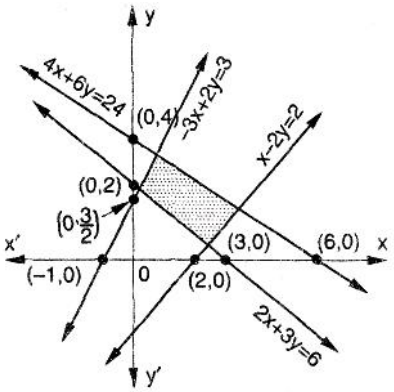
(iv) $5x + y \geq 10, 2x + 2y \geq 12, x + 4y \geq 12, x \geq 0, y \geq 0$

35 Show that the solution set of the following linear inequations is empty set:

(i) $x - 2y \geq 0, 2x - y \leq -2, x \geq 0, y \geq 0$

(ii) $x + 2y \leq 3, 3x + 4y \geq 12, y \geq 1, x > 0, y \geq 0$

36 Find the linear inequations for which the shaded area in Fig. is the solution set. Draw diagram of the solution set of the linear inequations:



37 Find the linear inequations for which the solution set is the shaded region given in Fig.