EXERCISE 5.1

1. Solve $24x < 100$, when
(i) x is a natural number. (ii) x is an integer.

2. Solve $-12x > 30$, when
(i) x is a natural number. (ii) x is an integer.

3. Solve $5x - 3 < 7$, when
(i) x is an integer. (ii) x is a real number.

4. Solve $3x + 8 > 2$, when
(i) x is an integer. (ii) x is a real number.

Solve the inequalities in Exercises 5 to 16 for real x.

5. $4x + 3 < 5x + 7$ **6.** $3x - 7 > 5x - 1$

7. $3(x - 1) \leq 2(x - 3)$ **8.** $3(2 - x) \geq 2(1 - x)$

9. $x + \frac{x}{2} + \frac{x}{3} < 11$ **10.** $\frac{x}{3} > \frac{x}{2} + 1$

11. $\frac{3(x-2)}{5} \leq \frac{5(2-x)}{3}$ **12.** $\frac{1}{2}\left(\frac{3x}{5} + 4\right) \geq \frac{1}{3}(x - 6)$

13. $2(2x + 3) - 10 < 6(x - 2)$ **14.** $37 - (3x + 5) \geq 9x - 8(x - 3)$

15. $\frac{x}{4} < \frac{(5x-2)}{3} - \frac{(7x-3)}{5}$ **16.** $\frac{(2x-1)}{3} \geq \frac{(3x-2)}{4} - \frac{(2-x)}{5}$

Solve the inequalities in Exercises 17 to 20 and show the graph of the solution in each case on number line

17. $3x - 2 < 2x + 1$ **18.** $5x - 3 \geq 3x - 5$

19. $3(1 - x) < 2(x + 4)$ **20.** $\frac{x}{2} \geq \frac{(5x-2)}{3} - \frac{(7x-3)}{5}$

21. Ravi obtained 70 and 75 marks in first two unit test. Find the minimum marks he should get in the third test to have an average of at least 60 marks.

22. To receive Grade 'A' in a course, one must obtain an average of 90 marks or more in five examinations (each of 100 marks). If Sunita's marks in first four examinations are 87, 92, 94 and 95, find minimum marks that Sunita must obtain in fifth examination to get grade 'A' in the course.

23. Find all pairs of consecutive odd positive integers both of which are smaller than 10 such that their sum is more than 11.

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

25. The longest side of a triangle is 3 times the shortest side and the third side is 2 cm shorter than the longest side. If the perimeter of the triangle is at least 61 cm, find the minimum length of the shortest side.

26. A man wants to cut three lengths from a single piece of board of length 91cm. The second length is to be 3cm longer than the shortest and the third length is to be twice as long as the shortest. What are the possible lengths of the shortest board if the third piece is to be at least 5cm longer than the second?
[***Hint****:* If x is the length of the shortest board, then x , $(x + 3)$ and $2x$ are the lengths of the second and third piece, respectively. Thus, $x + (x + 3) + 2x \leq 91$ and $2x \geq (x + 3) + 5$].