

## Chapter-6: Inequality

**Question ► 1** Heights of some students in your class are greater than 5 feet and some students are less than 5 feet.

*[Selected Question]*

- a. Express the problem in the form of inequalities. 2
- b. If the total height of the students which is greater than 5 feet is 240 feet and smaller than 5 feet is 420 feet and the number of students with smaller height is twice the number of the students of greater height, express the inequality in term of x. 4
- c. Express the inequality in term of y and show the solution set of x and y on the number line. 4

### Solution to the question no. 1

**a** Express the problem of stimulus in terms of an inequality by taking the number of students whose height is greater than 5 feet is x and the number of students whose height is less than 5 feet is y.

Given, the number of students whose height is greater than 5 feet is x and the number of students whose height is smaller than 5 feet is y.

$$\therefore \text{Total height of } x \text{ students} > 5x$$

$$\text{Total height of } y \text{ students} < 5y$$

**b** Here, total height of the students whose height is greater than 5 feet = 240 feet and the total height of the students less than 5 feet = 420 feet.

$\therefore$  According to the inequality obtained from 'a' we get,

$$240 > 5x$$

$$\text{or, } 48 > x \text{ .....(i)}$$

$$\text{and } 420 < 5y$$

$$\text{or, } 84 < y \text{ .....(ii)}$$

Again, if  $y = 2x$ ,

From the equation (ii) we get,  $84 < 2x$

$$\text{or, } 42 < x \text{ ..... (iii)}$$

From (i) and (iii) we get;

$$42 < x < 48 \text{ (Ans.)}$$

**c** From 'b' we get,

$$48 > x \text{ or, } 96 > 2x \text{ and } y = 2x$$

$$\therefore 96 > 2x$$

$$\text{or, } 96 > y$$

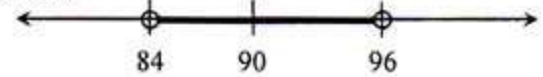
$$\therefore y < 96 \text{ .....(iv)}$$

From (ii) and (iv) we get,

$\therefore$  Solution set of the inequality of y,

$$S = \{x \in \mathbb{N} : 84 < y < 96\} \text{ (Ans.)}$$

and the number line:

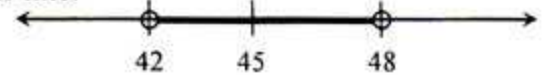


Inequality of x:  $42 < x < 48$  [we get from 'b']

$\therefore$  Solution set of the inequality of x,

$$S = \{x \in \mathbb{N} : 42 < x < 48\} \text{ (Ans.)}$$

and the number line:



**Question ► 2** David has bought x kg apples at the rate of Tk. 140 per kg. He has given a note of Tk. 1000 to the seller.

*[Selected Question]*

- a. How much money will the seller return to David? 2
- b. If the seller returns the remaining money with x number note of Tk.50, then express the problem in terms of an inequality and solve it. 4
- c. Find the possible values of x and express it as a solution set. 4

### Solution to the question no. 2

**a** Price of x kg apple at the rate of Tk. 140 = Tk.140x

$\therefore$  The seller will return to David Tk. (1000 – 140 x)

**b** Again, Price of x number of notes of Tk.50 = Tk.50x

Since the seller return the remaining money with x notes of Tk.50, so the sum of price of apple and the remaining money is less than Tk.1000.

According to the question,  $140x + 50x \leq 1000$

$$\text{or, } 190x \leq 1000$$

$$\text{or, } x \leq \frac{1000}{190}$$

$$\text{or, } x \leq \frac{100}{19}$$

$$\therefore x \leq 5.26 \text{ (approx.) (Ans.)}$$

**c** Since the number of notes can never be fraction, so the value of x can be any positive number which is less or equal 5.

So, the possible values of x:  $1 \leq x \leq 5$

Then, the required solution set,  $S = \{x \in \mathbb{N} : 1 \leq x \leq 5\}$  (Ans.)