General instructions for Students: Whatever be the notes provided, everything must be copied in the Mathematics copy and then do the HOMEWORK in the same copy.

<u>CLASS – 8 12. LINEAR EQUATIONS AND INEQUALITIES IN ONE VARIABLE MATHS</u>

Application of Linear Equations

Exercise -12.2 (Part -II)

18. On a school picnic, a group of students agree to pay equally for the use of a full boat and pay Rs. 10 each. If there had been 3 more students in the group, each would have paid Rs. 2 less. How many students were there in the group.

Solution: Let number of students be x.

Total money = Rs. 10x

If 3 students joins the group then no. of students = x + 3

Total money for new group = Rs.8(x+3)

According to question, 10x = 8(x + 3)

$$\Rightarrow$$
 10x = 8x + 24

$$\implies$$
 10x - 8x = 24

$$\Rightarrow$$
 2x = 24 \Rightarrow x = 12 Ans.

23. Two equal sides of an isosceles triangle are 3x - 1 and 2x + 2 units.

The third side is 2x units. Find x and the perimeter of the triangle.

Solution:
$$3x-1=2x+2 \implies 3x-2x=2+1 \implies x=3$$
 Ans.
$$3x-1=3(3)-1=8 \text{ Units}$$

$$2x + 2 = 2(3) + 2 = 8$$
 Units

$$2x = 2(3) = 6$$
 Units

Now, perimeter of the triangle = 8 + 8 + 6 = 22 Units Ans.

25. The length of a rectangle is 5 cm less than twice its breadth. If the length is decreased by 3 cm and breadth increased by 2 cm, the perimeter of the resulting rectangle is 72 cm. Find the area of original rectangle.

Solution: Let breadth of a rectangle be x cm and length be 2x - 5 cm

Area of original rectangle = $(2x - 5) \times x$ cm²

Length is decreased by 3 cm = 2x - 5 - 3 = 2x - 8 cm

Breadth increased by 2 cm = x + 2 cm

Perimeter of the resulting rectangle = 72 cm

$$\Rightarrow$$
 2 (2x - 8 + x + 2) = 72

$$\Rightarrow$$
 3x - 6 = 36

$$\Rightarrow$$
 3x = 42 \Rightarrow x = 14

Now, Area of original rectangle = $(2x - 5) \times x$ cm²

$$= \{2(14) - 5\} \times 14 \text{ cm}^2$$

$$= 23 \times 14 \text{ cm}^2 = 322 \text{ cm}^2$$
 Ans.

28. A streamer goes downstream and covers the distance between two ports in 5 hours while it covers the same distance upstream in 6 hours. If the speed of the stream is 1 $^{\rm km}/_{\rm h}$ find the speed of the streamer in still water and the distance between two ports.

Solution: Let the speed of the streamer in still water be $x \frac{km}{h}$

Speed of the stream is
$$1 \frac{\text{km}}{\text{h}}$$

The speed of streamer downstream = $(x + 1) \frac{km}{h}$

The speed of streamer downstream = $(x-1) \frac{km}{h}$

Distance covered by streamer, downstream = 5(x + 1) km

Distance covered by streamer, upstream = 6(x-1) km

According to question, 5(x+1) = 6(x-1)

$$\Rightarrow$$
 5x + 5 = 6x - 6

$$\Rightarrow$$
 5x - 6x = -6 - 5

$$\Rightarrow$$
 $-x = -11 \Rightarrow x = 11 \frac{\text{km}}{\text{h}} \frac{\text{Ans.}}{\text{s.s.}}$

The distance between two ports = 5(11 + 1) = 5(12) = 60 km Ans.

HOMEWORK

EXERCISE - 12.2

QUESTIONS NUMBERS: 20, 22, 26 and 29
