CHAPTER 4

SIMPLE EQUATIONS

Points to Remember :

- An equation involving only a linear polynomial is called a linear equation. For example : $7x + 3 = 5$, $\frac{3}{2}x + 4 = \frac{1}{3}$ etc.
- An equation remains the same if the LHS and the RHS are interchanged.
- Changing terms of one side to other side is called transposing. While transposing a number, we change its sign. *e.g.,* $12p - 5 = 25$, $12p = 25 + 5$.

QUESTIONS

1. Change the given equations into statements

   (*i*) $3x + 5 = 27$ (*ii*) $7x = 49$

   (*iii*) $5x + 7 = 9$ (*iv*) $\frac{x}{3} + 5 = 8$

   (*v*) $\frac{3}{2}y + 7 = 29$.

2. Form equation for the following statements

   (*i*) 5 times a number is 25.

   (*ii*) One fourth of a number is 20.

   (*iii*) A number divided by 5 gives seven less than twice the number.

   (*iv*) 13 subtracted from three times a number is 8.

   (*v*) The length of a rectangle is 8 meters more than its breath and its perimeter is 256 m.

3. Take any number. Multiply it by 3. Add 49 and divide the result by 7 then we get 7. Express this in the form of an equation.

Solve the following equations and find the value of the variable :

4. $3x - 5 = 0$.

5. $\frac{5}{2}x = 10$.

6. $\frac{P}{4} + 7 = 5.$

7. $6z + 10 = -2$

8. $7 - 5x = 5 - 7x$

9. $2y + 3 = 5y + 7$

10. $5x - \frac{7}{3} = 3x - \frac{2}{3}.$

11. $\frac{3}{2}z - \frac{5}{3} = \frac{5}{3} + \frac{7}{2}z.$

12. $4y = \frac{2}{3}(3y - 7).$

13. $\frac{2x - 3}{3} = 1 - \frac{2}{3}x.$

14. $5x + 3 = \frac{4}{3}(1 + x).$

15. $\frac{5}{3}(2y - 1) = (3y - 5).$

16. $\frac{2}{5}(2x - 1) = \frac{4}{5}(3x - 5).$

17. $\frac{2y + 5}{3} = 3y - 8.$

18. $\frac{3x}{8} = 27.$

19. $\frac{y}{9} - \frac{y}{12} = \frac{1}{108}.$

20. $y - 2 = \frac{1}{5}(3y - 1).$

21. $\frac{7P + 8}{9} = 9.$

22. $5x + 0.7 = 2.9$

23. $4x + 0.8 = 7.2$

24. $0.16\ (5x - 2) = 0.4\ (x + 1).$

25. $2.8y = 54 + y.$

26. If $x = y + 2$, find the value of y from the equation $y - \frac{x - 2}{2} = \frac{2}{3}.$

27. If $x = y - 3$, find the value of y from the equation $y - \frac{x - y}{3} = \frac{4}{5}(y - x).$

28. If $x = y - 2$ and $\frac{x}{y} - \frac{x + 1}{y} = 1$, find x and y.

29. Find 3 consecutive numbers whose sum is 45.

30. Find 3 odd consecutive numbers whose sum is 27.

31. If the smaller of two consecutive odd integers is doubled, the result is 7 more than the larger integer. Find the two integers.

32. Nine added to thrice a whole number gives 45, find the number.

33. Twice a number when decreased by 7 gives, 15 find the number.

34. A number is $\frac{2}{5}$ times another number. If their sum is 70, find the numbers.

35. A number when added to its half gives 72. Find the number.

36. A number is as much greater than 21 as it is less than 71. Find the number.

37. What is the number which when multiplied by 20 gives the product 120?

38. Find a number which when multiplied by 5 is increased by 80.

39. The sum of ages of father and son is 75 years. If the age of the son is 25 years, find the age of father.

40. Find the multiple of 8, if the sum of two consecutive multiples of 8 is 184.

41. If two complementary angles differ by 20°, find the measure of each angles.

42. Two supplementary angles differ by 40°. Find their measure.

43. The angles of a triangle are $(3x)°$; $(2x + 60)°$ and $(5x - 40)°$. Find each angle.

44. Find the measure of an angle, if its supplement measures 39° more than twice its complement.

45. When the smaller of two consecutive integers is added to three time the larger integer the result is 43. Find both the numbers.

46. If 2 is subtracted from a number, then tripled, the result is 4 more than the given number. Find the number.

47. The age of father is 30 years more than that of his son. 5 years hence father's age will be thrice of his son's age, find their present ages.

48. The numerator of a rational number is 7 less than the denominator. If the denominator is increased by 9 and the numerator is also increased by 2, we again get the same rational number. Determine the number.

49. The sum of present ages of Sameer and his father is 54 years. 6 years ago, his father was 6 times as old as his son. Find their present ages.

50. The combined cost of a T.V. and a fan is Rs. 13000. The cost of T.V. is 12 times the cost of the fan. Find the cost of each.

51. Umesh has three boxes of different fruits. A weighs 5 kg. more than box B and box C weighs 10 kg. more that box B. The total weight of three boxes is 48 kg. How many kg. does box A weighs?

52. After 12 years. Manoj will be 3 times as old as he was 4 yrs. ago. What is his present age?

53. The age of Nishant and Sanjay are in the ratio 4 : 5. Ten years hence the ratio of their ages will be 6 : 7. Find their present ages.

ANSWERS

1. (*i*) Adding 5 to the 3 times of a number give 27

   (*ii*) 7 times a number is 49.

   (*iii*) Adding 7 to five times of a number gives 9.

(*iv*) Adding 5 to one third of x gives 8.

(*v*) Adding 7 to $\frac{3}{2}$ of a number gives 29.

2. (*i*) $5x = 25$ (*ii*) $\frac{y}{4} = 20$.

(*iii*) $\frac{x}{5} = 2x - 7$. (*iv*) $3y - 13 = 8$.

(*v*) $2(2b + 8) = 256$.

3. $\frac{3x + 49}{7} = 7$.

4. $x = \frac{5}{3}$.

5. $x = 4$.

6. P $= -8$.

7. $z = -2$

8. $x = -1$.

9. $y = \frac{-4}{3}$.

10. $x = \frac{5}{6}$.

11. $z = -\frac{5}{3}$.

12. $y = \frac{-7}{3}$.

13. $x = \frac{3}{2}$.

14. $x = \frac{-5}{11}$.

15. $y = -10$.

16. $x = \frac{9}{4}$.

17. $y = \frac{29}{7}$.

18. $x = 72$.

19. $y = \frac{1}{3}$.

20. $y = \frac{9}{2}$.

21. $P = \frac{73}{7}$.

22. $x = 0.44$

23. $x = 1.6$

24. $x = 1.8$

25. $y = 30$.

26. $y = \frac{4}{3}$.

27. $y = \frac{7}{5}$.

28. $y = -1$; $x = -3$.

29. 14, 15, 16.

30. 7, 9, 11.

31. 9, 11.

32. $x = 12$.

33. $x = 11$.

34. 20, 50

35. 48

36. 46

37. 6

38. 20

39. 50 years.

40. 88, 96.

41. 35°, 55°

42. 70°, 110°

43. 48°, 92°, 40°

44. 39°

45. 10, 11

46. 5.

47. 10 years; 40 years.

48. $\frac{2}{9}$.

49. 12 years, 42 years

50. Rs. 1000 = cost of fan; Rs. 12000 = cost of T.V.

51. 16 kg.

52. 12 years.

53. 20 years and 25 years.