Section A

1. If x = a, then which of the following is not always true for an integer k.

(a) kx = ak (b) x/k = a/k

(c) x - k = a – k (d) x + k = a + k

2. x = -12 is the solution of the linear equation 5x -3(2x + 1) = 21+x. State whether the statement is true or false.

3. Solve: $\frac{x}{2} + \frac{x}{4} + \frac{x}{5} + 1000 = x$

4. The solution of which of the following equations is neither a fraction nor an integer

(a) 2x + 6 = 0 (b) 3x - 5 = 0

(c) 5x - 8 = x + 4 (d) 4x + 7 = x + 2

5. If 8x - 3 = 25 + 17x, then x is

(a) a fraction (b) an integer

(c) a rational number (d) cannot be solved

6. If $\frac{5x}{3} - 4 = \frac{2x}{5}$, then the numerical value of 2x – 7 is

(a) 19/13 (b) -13/19 (c) 0 (d) 13/19

7. If a and b are positive integers, then the solution of the equation ax = b has to be always

(a) positive (b) negative (c) one (d) zero

8. Linear equation in one variable has

(a) only one variable with any power. (b) only one term with a variable.

(c) only one variable with power 1. (d) only constant term.

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

10. The digit in the tens place of a two-digit number is 3 more than the digit in the units place. Let the digit at unit place be b. Then the number is

11. The sum of three consecutive multiples of 7 is 357. Find the smallest multiple.

(a) 112 (b) 126 (c) 119 (d) 116

12. The solution of the equation $2y = \frac{5y-18}{5}$ is _____. Fill in the blanks to make the statement true.

13. Three consecutive numbers whose sum is 12 are _____, _____ and _____. Fill in the blanks to make the statement true.

14. The solution of the equation $\frac{x}{2} - \frac{1}{5} = \frac{x}{3} + \frac{1}{4}$

(a) 2.7 (b) 1.8 (c) 2.9 (d) 1.7

15. If we subtract 1/2 from a number and multiply the result by 1/2, we get 1/8, then the number is

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{1}{4}$ (d) none of these

16. If the perimeter of a rectangle is 13 cm and its width is $2\frac{3}{4}$ cm, then its length is

(a) $2\frac{3}{4}$ (b) $3\frac{3}{4}$ (c) $4\frac{3}{4}$ (d) $5\frac{3}{4}$

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18. The sum of digits of a two-digit number is 8. If the number obtained by reversing the digits is 18 more than the original number, then the original number is

(a) 35 (b) 53 (c) 26 (d) 62

19. Arjun is twice as old as Shriya. If five years ago his age was three times Shriya's age, then Arjun's present age is

(a) 10 years (b) 15 years (c) 20 years (d) 25 years

Section B

20. $\frac{3x}{4} - \frac{1}{4}(x - 20) = \frac{x}{4} + 32$

21. $\frac{x}{3} - 2\frac{1}{2} = \frac{4x}{9} - \frac{2x}{3}$

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

23. Fifteen less than 4 times a number is 9. Find the number.

24. Six more than one-fourth of a number is two-fifths of the number. Find the number.

25. Separate 178 into two parts so that the first part is 8 less than twice the second part.

26. The difference between two numbers is 3 and the difference of their squares is 69. Find the numbers.

Section C

27. A rectangle's length is 5 cm less than twice its width. If the length is decreased by 5 cm and width is increased by 2 cm; the perimeter of the resulting rectangle will be 74 cm. Find the length and the width of the original rectangle.

28. The distance between two stations A and B is 690 km. Two cars start simultaneously from A and B towards each other, and the distance between them after 6 hours is 30 km. If the speed of one car is less than the other by 10 km/hr, find the speed of each car.

29. (x + 2) (x + 3) + (x – 3) (x -2) – 2x (x+1) = 0

30. $\frac{x+2}{6} - \left[\frac{11-x}{3} - \frac{1}{4}\right] = \frac{3x-4}{12}$

31. The ages of A and B are in the ratio 7 : 5. Ten years hence, the ratio of their ages will be 9 : 7. Find their present ages.

32. Find the number whose double is 45 greater than its half.