BHARATIYA VIDYA BHAVAN'S V M PUBLIC SCHOOL, VADODARA

QUESTION BANK

CHAPTER 3 LINEAR EQUATIONS IN TWO VARIABLES

SOLVE THE FOLLOWING WORD PROBLEMS

1. 6 men and 10 women can finish making pots in 8 days, while the 4 men and 6 women can finish it in 12 days. Find the time taken by the one man alone and one woman alone to finish the work.

2. A boat covers 14 kms in upstream and 20 kms downstream in 7 hours. Also it covers 22 kms upstream and 34 kms downstream in 10 hours. Find the speed of the boat in still water and that of the stream.

3. Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction with different speed they meet in 5 hrs and if they travel towards each with different speed they meet in 1hr. What are the speeds of the cars?

4. Form the pair of linear equations in the following problem and find their solutions (if they exist) by the elimination method: A lending library has a fixed charge for first three days and an additional for each day there after. Sarita paid Rs 27 for a book kept for seven days, while

Suzy paid Rs 21 for a book she kept for 5 days. Find the fixed charge and charge for extra day.

5. The population of a village is 1000, if in a year number of males to increase by 5% and number of females by 3%, the population will grow to 10404 at the end of a year. Find the number of males and females in the village at present.

6. The monthly income ratio of A and B is 4:7 and their expenditure ratio is 4:3 if each saves Rs 1600 per month, find the monthly income of each.

7. There are two numbers. If four times the larger of two numbers is divided by the smaller one, we get 8 as quotient and 0 as remainder. If six times the smaller of two numbers is divided by the larger one, we get 3 as quotient and 0 as remainder. Find the numbers.

8. Neel and Sunil have some apples. Neel says to Sunil, "if you give me 12 of your apples, I will have twice the number of apples left with you". Sunil replies, "if you give me 12 of your apples I will have the same number of apples left with you". Find the the number of apples with Neel and Sunil separately.

9. Bala is three times as old as his son. After 16 years, Bala will be two times as hold as his son. Find the current age of Bala and his son.

10. In a two digit number, sum of its digits is 13. If 27 is added to the number, the digit Interchange their places. Find the number.

11. Priyanka has only Rs.2 and Rs.1 notes with her. If the total number of notes that she has is 19 and the amount of money with her is Rs.26, then find the number of Rs. 2 and Rs.1 notes.

12. Five years ago Tina was six times older than her son. After five years, Tina will be 6 years more than two times the age of her son. Find the present age of Tina and her son.

13. A two digit number is 9 more than 4 times the sum of its digits. If 18 is added to the number, the digit interchanges their places. Find the number.

14. Last year 1 kg of tea and 3 kg of sugar together cost Rs 96. This year, the rates of tea increased by 15% and that of sugar by 10%. So the amount of tea and sugar now cost Rs. 108.60. Find the per kg rates of tea and sugar last year.

15. A boat goes 24 km upstream & 28 km downstream in 6 hours. In 6.5 hours, it can go 30 km upstream & 21 km downstream. Find the speed of stream and the speed of boat in still water.

16. A person invests some amount @ 12% S.I. and some other amount @ 10% S.I..He receives an annual interest of Rs.1300. But if he interchanges the amounts invested, he shall receive Rs.40 more as interest. How much has he invested at each rate?

17. If 1 is added to both the numerator and the denominator of a fraction, it becomes equal to 8 /7. If, however, 1 is subtracted from both the numerator & denominator of the same fraction, it becomes equal to 7 /6. Find the fraction.

18. The age of a father 8 yrs back was 5 times that of his son. After 8 yrs, his age will be 8 yrs more than double the age of his son. Find their present ages.

19. There are some lotus flowers in a lake. If 1 butterfly sits on each flower, one butterfly is left behind. If 2 butterflies sit on each flower, 1 flower is left behind. What is the no. of flowers? What is the no. of butterflies?
20. 5 pencils and 7pens together cost Rs. 50 whereas 7 pencils and 5 pens together cost Rs. 46. Find the cost of one pencil and that of one pen.

21. Find the value of c for which the pair of equations : $2x + cy = 1$; $3x + 5y = 7$ will have (i) a unique solution; (ii) no solution. Is there a value of c for which the system has infinite number of solutions?

22. Find the value of k so that the lines $2x – 3y = 9$ and $kx-9y =18$ will be parallel.

23. Find the value of k for which $x + 2y =5$, $3x+KY+15=0$ is inconsistent.

24. Solve graphically the following pairs of linear equations:
(i) $2x – y = 4$, $3y – x = 3$ Also, find the coordinates of the points where these lines intersect the 2 axes. (ii) $2x + 3y = 12$, $x – y = 1$ Shade the region (area) between the 2 lines and x axis.

25. Find graphically the coordinates of the vertices of a triangle whose sides have the equations: (i) $y = x$, $y = 0$ and $2x + 3y = 30$ (iii) $y = x$, $3y = x$ and $x + y = 8$ (ii) $2y –x = 8$, $5y – x = 14$ and $y – 2x = 1$

26. Solve the following pair of linear equations graphically: $3x + y – 11 = 0$; $x – y – 1 = 0$. Shade the region bound by these lines and the axis of y.

27. Solve the given pairs of equations: (i) $5m – 5n = 12$; $2m + 9n = 20$ (ii) $39 x + 41y = 76$; $41x + 39y = 84$ (iii) $8x – 3y = 5xy$; $6x – 5y = - 2xy$ (iv) $a x - b y = a – b$; $2 a x - 2 b y = 0$ $(a \neq b)$
(v) $99x + 101y = 499$; $101x + 99y = 501$

28. For what value of k the following pair has infinite number of solutions.
$(k-3)x + 3y = k$ and $k(x+y)=12$

29. Write condition so that $a_1x + b_1y = c_1$ and $a_2x + b_2y = c_2$ have (i) unique solution (ii) No solution. Find the value of c for which the pair of equations: $2x + cy = 1$; $3x + 5y = 7$ will

have (i) a unique solution; (ii) no solution. Is there a value of c for which the system has infinite number of solutions?

30. (i) If $2x + y = 35$ and $3x + 4y = 65$, find the value of xy.

(ii) Solve the equation: $px + qy = p - q$, $qx - py = p + q$

(iii) Solve : $141x + 103y = 217$; $103x + 141y = 27$ by all three methods.

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