

AADHARSHILA STUDIES
(HOME ASSIGNMENT-MATHEMATICS)
(CLASS – X)(Leniar Equations of

1. Solve following system of linear equations for given variables:

a) $\frac{1}{2x} - \frac{1}{y} = -1$, $\frac{1}{x} + \frac{1}{2y} = 8$

b) $\frac{2}{x} + \frac{2}{3y} = \frac{1}{6}$, $\frac{3}{x} + \frac{2}{y} = 0$

c) $x + 2y = \frac{3}{2}$, $2x + y = \frac{3}{2}$

d) $\frac{x}{2} + \frac{y}{4} = 3$, $2x - y = 4$

e) $\frac{5x}{6} - \frac{y}{8} = 4$, $\frac{x}{3} + \frac{y}{4} = 4$

f) $4x + \frac{6}{y} = 15$, $6x - \frac{8}{y} = 14$

g) $\frac{x}{2} + y = 0.8$, $\frac{7}{x+(y/2)} = 10$

h) $7(y+3) - 2(x+2) = 14$, $4(y-2) + 3(x-3) = 2$

i) $\frac{1}{7x} + \frac{1}{6y} = 3$, $\frac{1}{2x} - \frac{1}{3y} = 5$

j) $2(3u - v) = 5uv$, $2(u+3v) = 5uv$

k) $\frac{5}{x+1} - \frac{2}{y-1} = \frac{1}{2}$, $\frac{10}{x+1} + \frac{2}{y-1} = \frac{5}{2}$

l) $\frac{x+y}{xy} = 2$, $\frac{x-y}{xy} = 6$

m) $149x - 330y = -511$, $-330x + 149y = -32$

n) $\frac{6}{x+y} - \frac{7}{x-y} = 3$, $\frac{1}{2(x+y)} - \frac{1}{3(x-y)} = 0$

o) $\frac{2}{3x+2y} + \frac{3}{(3x-2y)} = \frac{17}{5}$, $\frac{5}{(3x+2y)} + \frac{1}{(3x-2y)} = 2$

2. Solve following system of equations by method of cross multiplication:-

a) $\frac{x}{a} + \frac{y}{b} = a+b$, $ax - by = a^2 - b^2$

b) $x + y = a + b$, $ax - by = a^2 - b^2$

c) $\frac{x}{a} = \frac{y}{b}$, $ax + by = a^2 + b^2$

d) $(a - b)x + (a + b)y = a^2 - 2ab - b^2$, $(a + b)(x + y) = a^2 + b^2$

3. Find the value of 'k' in each case applying the given conditions :-

a) Find the value of k for which the following system of linear equations has a unique solution :

$$2x + 5y = 7, \quad 3x - ky = 5$$

b) Find value of k for which the following system of equations has no solution : $kx + 2y = 1$, $5x - 3y = -2$.

c) Determine the value of k for which following system of equations has infinite solutions : $(k - 3)x + 3y = k$, $kx + ky = 12$.

d) Determine value of k for which system of equations $3x - ky = 5$, $2x + 7y = -6$ has no unique solution.

e) Find value of p for which given system has an infinite solution :

$$2x + 3y = 4, \quad (k + 2)x + 6y = 3k + 2$$

4. The age of a father is 3 years more than 3 times the son's age .3 years hence the age of father will be 10 years more than twice the age of the son . Find their present ages .
5. The sum of a two digit number and the number obtained by reversing the order of digits is 121.The two digits differ by 3 .Find the number.
6. The age of a father is equal to the sum of the ages of his 5 children .After 15 years sum of the ages of the children will be twice the age of the father .Find the age of the father.
7. Students of a class are made to stand in rows. If 4 students are extra in a row , there would be two rows less .If 4 students are less in a row ,there would be four more rows .Find the number of students in the class.
8. Points A and B are 90 km apart from each other. A car starts from A and another from B at the same time .If they go in the same direction , they meet in 9 hours and if they go in opposite direction ,they meet in $\frac{9}{7}$ hours .Find their speeds.
9. Ramesh travels 300 km to his home partly by train and partly by bus. He takes 4 hours , if he travels 60 km by train and rest by bus .If he travels 100 km by train and rest by a bus ,he takes 10 minutes longer . Find speeds of train and the bus.
10. A man rowing at the rate of 5 km/hr in still water takes thrice as much time in rowing 40 km up the river as in 40 km down . Find the rate at which the river flows.

11. A takes 3 hours more than B to walk 30 km . But if a doubles his pace , he is ahead of B by $\frac{3}{2}$ hours .Find their speeds of walking.
12. A train covered a certain distance at a uniform speed .If the train would have been 6 km/h faster ,it would have taken 4 hours less than the scheduled time. And if the train were slower by 6 km/h it would have taken 6 hours more than the scheduled time .Find the length of the journey.
13. On selling a tea set at 5 % loss and a lemon set at 15 % gain ,a crockery seller gains Rs. 7 .If he sells the tea set at 5 5 gasin and the lemon set at 10 % gain ,he gains Rs. 13 .Find the actual price of the tea set.
14. In an examination paper ,one mark is awarded for every correct answer while $\frac{1}{4}$ mark is deducted for every wrong answer .A student answered 120 questions and got 90 marks .How many questions did he answer correctly .
15. A man sold a chair and a table together for Rs. 1520 thereby making a profit of 25% on chair and 10% on table. By selling them together for Rs. 1535 he would have made a profit of 10% on the chair and 25% on the table . Find cost price of each.
16. A boat goes 35 km upstream and 55 Km downstream in 12 hrs . It can go 30 Km upstream and 44 Km downstream in 10 hrs . Find the speed of the stream and that iof the boat in still water .
