

PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

ASSIGNMENT – 3(A)

SUBJECTIVE

1. Solve for x and y :

$$148x + 231y = 527$$

$$231x + 148y = 610$$

2. For what values of k will the system of equations have infinitely many solutions? [CBSE 2015]

$$kx + 3y = k - 3$$

$$12x + ky = k$$

3. Solve for x and y:

$$2^x + 3^y = 17$$

$$2^{x+2} - 3^{y+1} = 5$$

4. Solve the following equations using the method of cross multiplication: [CBSE 2016]

$$\frac{x}{a} + \frac{y}{b} = 2$$

$$ax - by = a^2 - b^2.$$

5. Find the values of k for which the following system of equations is inconsistent [CBSE 2014]

$$(3k+1)x + 3y = 2$$

$$(k^2+1)x + (k-2)y - 5 = 0$$

6. It takes 12 hours to fill a swimming pool using two pipes. If the pipe of larger diameter is used for 4 hours and the pipe of smaller diameter for 9 hours, only half the pool can be filled. How long would it take for each pipe to fill the pool separately?

7. The sum of a two digit number and the number formed by reversing its digits is 110. If 10 is subtracted from the number, the new number is 4 more than 5 times the sum of the digits in the original number. Find the number. [CBSE 2017]

8. Susan invested certain amount of money in two schemes A and B, which offer interest at the rate of 8% per annum and 9% per annum, respectively. She received ₹ 1860 as annual interest. However, had she interchanged the amount of investments in the two schemes, she would have received ₹ 20 more as annual interest. How much money did she invest in each scheme? [HOTS]

9. X takes 3 hours more than Y to walk 30 km. But, if X doubles his speed, he is ahead of Y by 1.5 hours. Find their speed of walking. [HOTS]

10. In a function if 10 guests are sent from room A to B, the number of guests in room A and B are same. If 20 guests are sent from B to A, the number of guests in A is double the number of guests in B. Find number of guests in both the rooms in the beginning.

11. A vessel contains a mixture of 24 litres milk and 6 litres water and second vessel contains a mixture of 15 litres milk and 10 litres water. How much mixture of milk and water should be taken from the first and the second vessel separately and kept in a third vessel so that the third vessel may contain a mixture of 25 litres milk and 10 litres water.

12. A shopkeeper sells a shirt at 8% profit and a sweater at 10% discount, thereby, getting a sum ₹ 1008. If she had sold the shirt at 10% profit and the sweater at 8% discount, she would have got ₹ 1028. Find the cost price of the shirt and the list price (price before discount) of the sweater.

13. Solve graphically:

$$2x + y = 6$$

$$2x - y + 2 = 0$$

Find the ratio of the area of two triangles formed by the lines representing these equations with the x-axis and the lines with the line $x=0$.

14. Draw the graphs of the following equations:

$$2x+y=2; 2x+y=6.$$

Find the coordinates of the trapezium formed by these lines. Also find its area.

15. Draw the graphs of the equations: $-x + 3y = 6$; $2x - 3y = 12$ and hence find a if $3x + 2y = 3+ a$. Find the area of the triangle formed by these lines with Y-axis.

16. Show graphically that the pair of linear equations

[CBSE 2014]

$$2x - 2y - 2 = 0$$

$$4x - 4y - 10 = 0 \text{ is inconsistent.}$$

17. A and B are friends and their ages differ by 2 years. A's father D is twice as old as A and B is twice as old as his sister C. The age of D and C differ by 40 years. Find the ages of A and B.

18. A boat covers 32 km upstream and 36km downstream in 7 hours. Also, it covers 40 km upstream and 48km downstream in 9 hours. Find the speed of the boat in still water and that of the stream. [CBSE 2010, 2012]

19. A lab assistant has a solution of 50% acid and the other one having 25% acid. How much of each should be mixed to make 10 litres of 40% acid solution?

20. Vijay had some sweets. He divided them into two lots A and B. He sold the first lot at the rate of ₹2 for 3 sweets and the second lot at ₹1 per sweet and thus received a total of ₹400. Had he sold the first lot at the rate of ₹1 per sweet and the second lot at ₹4 for 5 sweets, his total collection would have been ₹ 460. Find the total number of sweets he had.

ANSWER KEY

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QUESTION NUMBER	ANSWER
1	$x=2, y=1$
2	$k=6$
3	$x=3, y=2$
4	$x=a, y=b$
5	$k= -1$
6	20 days, 30 days
7	Required number is 64
8	Money invested in scheme A= \square 12000 Money invested in scheme B= \square 10000
9	Speed of X= 3.33km/h Speed of Y= 5 km/h
10	No. of guests in room A= 100 No. of guests in room B= 80
11	Mixture taken form vessel A= 20litres Mixture taken from vessel B= 15litres
12	Cost price of shirt \square 600 Cost Price of sweater \square 400
13	Required ratio of areas is 4:1
14	Area of trapezium = 8 sq units
15	Area = 18 sq. units, $a=15$
16	Graph depicts parallel lines
17	Age of A= 26 years, Age of B= 24 years
18	Speed of boat = 10km/h and Speed of stream= 2km/h
19	Amount of first type of acid= 6litres Amount of second type of acid= 4litres
20	Total number of sweets= 500

