## <u>CLASS-X</u> <u>MATHEMATICS WORKSHEET</u> CHAPTER-3: LINEAR EQUATIONS IN TWO VARIABLES

## SHORT ANSWER TYPE QUESTIONS

- Q1. Solve the following pair of linear equations:
- ax + by = a bbx - ay = a + ba) (a + 2b) x + (2a - b) y = 2(a - 2b) x + (2a + b) y = 3b)  $(a - b) x + (a + b) y = a^2 - 2ab - b^2$  $(a + b) (x+y) = a^2 + b^2$ c) ax/b - by/a = a + bax - by = 2abd) 5/(x+1) - 2/(y-1) = 1/210/(x+1) + 2/(y-1) = 5/2e)  $a^{2}/x - b^{2}/y = 0$  $a^{2}b/x + b^{2}a/y = a + b$ , x,  $y \neq 0$ f)  $mx - ny = m^2 + n^2$  $\mathbf{x} - \mathbf{y} = 2\mathbf{n}$ **g**) xy/(x + y) = 6/5xy/(y - x) = 6 $\{(x+y) \neq 0, (y-x) \neq 0\}$ h)  $x/a^{2} - y/b^{2} = 0$  $b^{2}x - a^{2}y = 2a^{2}b^{2}$ x/a - y/b = (a - b)i)  $b^{2}x/a - a^{2}y/b = ab(a+b)$ i)
- Q2. Given below are three linear equations. Two of them have infinitely many solutions and two have a unique solution. State the pairs:

$$4x - 5y = 3, \quad 8x - 10y = 6, \quad 5x - 4y = 5$$

- Q3. Determine the value of k so that the following pairs of equations are inconsistent (3k + 1) x + 3y 2 = 0 $(k^2 + 1) x + (k - 2) y - 5 = 0$
- Q4. By comparing the ratios  $a_1/a_2$ ,  $b_1/b_2$  and  $c_1/c_2$ , find out for what value (s) of  $\alpha$ , the lines representing the following equations have a unique solution, no solution or infinitely many solution:
  - $\alpha x + 3y = \alpha 3$
  - $12x + \alpha y = \alpha$
- Q5. If 1 is added to each of the given two numbers, then their ratio is 1:2. If 5 is subtracted from each of the numbers, then their ratio is 5:11. Find the numbers.
- Q6. The ratio of the incomes of two persons is 9:7 and the ratio of their expenditures is 4:3. If each of them S aves Rs.200 per month, find their monthly incomes.
- Q7. A person starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was Rs.4500 after 4 years of service and Rs.5700 after 12 years of service, find his initial salary and the annual increment.
- Q8. Seven times a 2- digit number is equal to four times the number obtained by reversing the order of the digits. If the sum of both the digits is 9, find the number.
- Q9. A piece of work is done by 6 men and 5 women in 6 days or 3 men and 4 women in 10 days. How many days will it take for 9 men and 15 women to finish that work?
- Q10. A father's age is three times the sum of the ages of his two children. After 5 years, his age will be two times the sum of their ages. Find the present age of the father. (CBSE 2019)
- Q11. The students of a class are made to stand in rows. If 3 students are extra in a row, there would be 1 row less. If 3 students are less in a row, there would be 2 rows more. Find the number of students in the class.
- Q12. Find c if the system of equations cx + 3y + (3 c) = 0 and 12x + cy c = 0 has infinitely many solutions. (CBSE 2019)

## LONG ANSWER TYPE QUESTIONS

a)

Q13. Solve the following system of linear equations graphically

$$2x + 3y = 12$$
 b)  $2x + 4y - 10 = 0$ 

- 2y 1 = x 3x + 6y 12 = 0
- Q14. Draw the graph of the system of equations x + y=5 and 2x y + 2 = 0. Shade the region

bounded by these lines and the x- axis. Find the area of the shaded region.

- Q15. It takes only half the pool is filled. How long would it take 12 hours to fill a swimming pool using two pipes. If the larger pipe is used for 4 hours and the smaller pipe for 9 hours, for each pipe alone to fill the pool?
- Q16. Ankita travels 14 km to her home partly by rickshaw and partly by bus. She takes half an hour if she travels 2 km by rickshaw and the remaining distance by bus. On the other hand, if she travels 4 km by rickshaw and the remaining distance by bus, she takes 9 minutes longer. Find the speed of the rickshaw and of the bus.

## ANSWERS

- 1. a) x = 1, y = -1
  - b) x = (5b 2a)/10ab, y = (a+10b)/10ab
  - c) x = a + b, y = -2ab/(a + b)
  - d) x = b, y = -a
  - e) x = 4, y = 5
  - f)  $x = a^2, y = b^2$
  - g) x = m + n, y = m n
  - h) x = 2, y = 3
  - i)  $x = a^2$ ,  $y = b^2$
  - j)  $x = a^2$ ,  $y = -b^2$
- 3.  $k = -1, k \neq 19/2$
- 4. Unique sol:  $\alpha \neq 6$  or -6, No solution:  $\alpha = -6$ , Infinitely:  $\alpha = 6$
- 5. 35, 71
- 6. Rs. 1800, Rs. 1400
- 7. Rs. 3900, Rs. 150
- 8. 36
- 9. 3 days
- 10. 45
- 11. 36
- 12.
- 15. 20, 30
- 16. 10 km/hr, 40 km/hr