

CLASS-X
MATHEMATICS WORKSHEET
CHAPTER-3: LINEAR EQUATIONS IN TWO VARIABLES

SHORT ANSWER TYPE QUESTIONS

Q1. Solve the following pair of linear equations:

- | | |
|--|---|
| a) $ax + by = a - b$, | $bx - ay = a + b$ |
| b) $(a + 2b)x + (2a - b)y = 2$ | $(a - 2b)x + (2a + b)y = 3$ |
| c) $(a - b)x + (a + b)y = a^2 - 2ab - b^2$ | $(a + b)(x+y) = a^2 + b^2$ |
| d) $ax/b - by/a = a + b$ | $ax - by = 2ab$ |
| e) $5/(x+1) - 2/(y-1) = 1/2$ | $10/(x+1) + 2/(y-1) = 5/2$ |
| f) $a^2/x - b^2/y = 0$ | $a^2b/x + b^2a/y = a + b$, $x, y \neq 0$ |
| g) $mx - ny = m^2 + n^2$ | $x - y = 2n$ |
| h) $xy/(x + y) = 6/5$ | $xy/(y - x) = 6$ $\{(x + y) \neq 0, (y - x) \neq 0\}$ |
| i) $x/a - y/b = (a - b)$ | $x/a^2 - y/b^2 = 0$ |
| j) $b^2x/a - a^2y/b = ab(a + b)$ | $b^2x - a^2y = 2a^2b^2$ |

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 α , 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 saves 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

Q13. Solve the following system of linear equations graphically

a) $2x + 3y = 12$

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

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