Class 12 Mathematics: Linear Equations in Two Variables

Source: CBSE Previous Year Questions (PYQs) | Total Questions: 25

Part A: Multiple Choice Questions (MCQs)
(Strictly PYQ & Competency Based)

1. The pair of equations $x = a$ and $y = b$ graphically represents lines which are: (a) Parallel
   (b) Intersecting at (b, a)
   (c) Coincident
   (d) Intersecting at (a, b)
   (CBSE 2022)
2. The value of k for which the pair of equations $3x + 5y = 3$ and $6x + ky = 8$ do not have a solution is: (a) 5 (b) 10 (c) 15 (d) 20 (CBSE 2020)
3. If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of k is: (a) $\frac{-5}{4}$
   (b) $\frac{2}{5}$
   (c) $\frac{15}{4}$
   (d) $\frac{3}{2}$ (CBSE 2022)
4. The pair of linear equations $2x + 3y = 5$ and $4x + 6y = 10$ is: (a) Inconsistent (b) Consistent with unique solution (c) Consistent with infinitely many solutions (d) None of these (CBSE 2015)
5. If $2x + 3y = 12$ and $3x - 2y = 5$, then: (a) $x = 2, y = 3$ (b) $x = 2, y = -3$ (c) $x = 3, y = 2$ (d) $x = 3, y = -2$ (CBSE 2021)
6. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages (in years) of the son and the father are, respectively:
   (a) 4 and 24
   (b) 5 and 30
   (c) 6 and 36
   (d) 3 and 24 (CBSE Sample Paper)
7. If the pair of linear equations is consistent, then the lines will be:
   (a) Parallel
   (b) Always coincident
   (c) Intersecting or coincident
   (d) Always intersecting (CBSE 2023)

8. The value of k for which the system of equations $x + 2y = 3$ and $5x + ky + 7 = 0$ has a unique solution is:
   (a) $k \neq 1$
   (b) $k \neq 10$
   (c) $k \neq 3$
   (d) $k \neq 5$ (CBSE 2018)
9. One equation of a pair of dependent linear equations is $-5x + 7y = 2$. The second equation can be:
   (a) $10x + 14y + 4 = 0$
   (b) $-10x - 14y + 4 = 0$
   (c) $-10x + 14y + 4 = 0$ (d) $10x - 14y = -4$ (CBSE Exemplar)
10. If $bx + ay = a^2 + b^2$ and $ax - by = 0$, then the value of $x - y$ equals:
   (a) $a - b$
   (b) $b - a$
   (c) $a^2 - b^2$
   (d) $b^2 + a^2$ (CBSE 2022)

Part B: Subjective Questions (Short & Long Answer)
(Includes Finding k, Solving, and Word Problems)

11. Find the value of k for which the following pair of linear equations has infinitely many solutions (Coincident Lines):
$$kx + 3y = k - 3$$
$$12x + ky = k$$
(CBSE Outside Delhi 2016)
12. Find the value of k for which the pair of linear equations has a unique solution (Intersecting Lines):
$$kx + 2y = 5$$
$$3x + y = 1$$
(CBSE 2019)
13. Determine the value of k for which the system of equations is inconsistent (Parallel Lines/No Solution):
$$3x + y = 1$$
$$(2k - 1)x + (k - 1)y = 2k + 1$$
(CBSE Delhi 2020)
14. Solve for x and y using the method of elimination:
$$152x - 378y = -74$$
$$-378x + 152y = -604$$
(NCERT Exemplar / CBSE Standard 2019)
15. Solve for x and y :
$$\frac{a}{x} - \frac{b}{y} = 0$$
$$\frac{ab^2}{x} + \frac{a^2b}{y} = a^2 + b^2$$
(where $x, y \neq 0$) (CBSE 2023)
16. The sum of the digits of a two-digit number is 9 . Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number. (CBSE 2018)
17. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction. (CBSE 2020)

18. 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 at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars? (CBSE 2015/2021)
19. 2 women and 5 men can together finish an embroidery work in 4 days, while 3 women and 6 men can finish it in 3 days. Find the time taken by 1 woman alone to finish the work, and also that taken by 1 man alone. (CBSE 2023)
20. The area of a rectangle gets reduced by 9 square units if its length is reduced by 5 units and breadth is increased by 3 units. If we increase the length by 3 units and the breadth by 2 units, the area increases by 67 square units. Find the dimensions of the rectangle. (NCERT / CBSE PYQ)
21. Solve the following pair of equations by reducing them to a pair of linear equations:

$$\frac{5}{x-1} + \frac{1}{y-2} = 2$$
$$\frac{6}{x-1} - \frac{3}{y-2} = 1$$ (CBSE 2021)

22. Find the values of a and b for which the following pair of linear equations has an infinite number of solutions:

$$2x + 3y = 7$$
$$(a-b)x + (a+b)y = 3a + b - 2$$ (CBSE Foreign 2018)

23. A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km downstream. Determine the speed of the stream and that of the boat in still water. (CBSE Standard 2019)

Part C: Case-Based Questions

24. **Case Study 1:** The Taxi Charges In a city, taxi charges consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km , the charge paid is ₹105 and for a journey of 15 km , the charge paid is ₹155. (Based on CBSE Sample Paper 2023)

    (i) Form the pair of linear equations representing the above situation.

    (ii) Find the fixed charge and the charge per km .

    (iii) How much does a person have to pay for traveling a distance of 25 km ?

25. **Case Study 2:** The Test Score Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each incorrect answer, then Yash would have scored 50 marks. (Based on CBSE 2021 Case Study)

    (i) Represent this situation algebraically.

    (ii) Find the number of right answers and wrong answers.

    (iii) Find the total number of questions in the test.
