

## Mathematics Assignment (Class-X)

### Chapter- 3 Pair of Linear Equations in Two Variables

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|    | <b>1 MARKER QUESTIONS</b>                                                                                                                                                                                                                                                                                                       |
| 1  | For what value of $p$ does the pair of equations given below has a unique solution?<br>$4x + py + 8 = 0$ ; $2x + 2y + 2 = 0$ .                                                                                                                                                                                                  |
| 2  | Find the value of $k$ for which the pair of linear equations $5x - 3y = 0$ ; $4x + ky = 0$ has a non-zero solution.                                                                                                                                                                                                             |
| 3  | Write the condition for which the pair of equations $ax + 2y = 7$ and $3x + by = 16$ represent parallel lines.                                                                                                                                                                                                                  |
| 4  | Customers are asked to stand in the lines. If one customer is extra in a line, then there would be two less lines. If one customer is less in line, there would be three more lines. Then the number of students in the class is<br>a) 40                      b) 50                      c) 60                      d) 70      |
| 5  | The sum of two digits and the number formed by interchanging its digit is 110. If ten is subtracted from the first number, the new number is 4 more than 5 times of the sum of the digits in the first number. Find the first number.<br>a) 46                      b) 48                      c) 64                      d) 84 |
| 6  | Rozy can row downstream 20 km in 2 hours, and upstream 4 km in 2 hours. What will be the speed of rowing in still water?<br>a) 6 km/hr              b) 4 km/hr              c) 3 km/hr              d) 7 km/hr                                                                                                                  |
| 7  | If $x = a$ , $y = b$ is the solution of the pair of equation $x - y = 2$ and $x + y = 4$ then the value of $a$ and $b$ will be:<br>a) (2,1)                      b) ( 3,1 )                      c) (4,6 )                      d) ( 1,2)                                                                                       |
|    | <b>2 MARKER QUESTIONS</b>                                                                                                                                                                                                                                                                                                       |
| 9  | Is $5x - 7 = -2$ and $10x - 14y + 4 = 0$ a pair of dependent linear equations? Justify.                                                                                                                                                                                                                                         |
|    | (10 to 12) Solve the following pairs of linear equations as indicated:                                                                                                                                                                                                                                                          |
| 10 | $2x - y = 6$ ; $x - y = 2$ (by cross multiplication method)                                                                                                                                                                                                                                                                     |
| 11 | $x + y = 7$ ; $5x + 12y = 0$ (by elimination method)                                                                                                                                                                                                                                                                            |
| 12 | $2x + y = 35$ ; $3x + 4y = 65$ (by substitution method)                                                                                                                                                                                                                                                                         |
| 13 | Find the value of $k$ for which the following linear equations have no solution:<br>$(3k + 1)x + 3y - 2 = 0$ ; $(k^2 + 1)x + (k - 2)y - 5 = 0$                                                                                                                                                                                  |
| 14 | Find the value of $\alpha$ for which the system of linear equations has an infinite number of solutions. $(\alpha - 1)x - y = 5$ ; $(\alpha + 1)x + (1 - \alpha)y = 3\alpha + 1$                                                                                                                                                |
| 15 | Find the value of $p$ and $q$ for which the following system of linear equations has an infinite number of solutions. $2x - y = 5$ ; $(p + q)x + (2q - p)y = 15$                                                                                                                                                                |

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|    | <b>3 MARKER QUESTIONS</b>                                                                                                                                                                                                                                                               |
| 16 | A father is 3 times as old as his son. After two years, his age will be two and a half times as old as his son. Represent this situation algebraically and solve it.                                                                                                                    |
| 17 | The sum of numerator and denominator of a fraction is 8. If 3 is added to both the numerator and denominator, the fraction becomes $\frac{3}{4}$ . Find the fraction.                                                                                                                   |
| 18 | The sum of the digits of a two-digit number is 12. The number obtained by interchanging the digits exceeds the given number by 18. Find the number.                                                                                                                                     |
| 19 | Solve the system of linear equation graphically: $4x - 5y - 20 = 0$ ; $3x + 5y - 15 = 0$<br>Determine the vertices of the triangle formed by the lines, representing the above equations and the $y$ – axis.                                                                            |
| 20 | The ratio of 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.                                                                                                                              |
| 21 | Show that the straight lines represented by the equations: $3x + y + 5 = 0$ ; $3y - x = 5$ and $2x + 5y = 1$ are concurrent and find the coordinates of the point where they intersect.                                                                                                 |
| 22 | The denominator of a fraction exceeds the numerator by 3. If the difference between the square of the denominator and the square of the numerator is 21, find the fraction.                                                                                                             |
| 23 | Solve the system of equations:<br>$\frac{57}{x+y} + \frac{6}{x-y} = 5$ and $\frac{38}{x+y} + \frac{21}{x-y} = 9$                                                                                                                                                                        |
| 24 | Solve: $2x + 15y = 17xy$ ; and $5x + 5y = 36xy$                                                                                                                                                                                                                                         |
|    | <b>4 MARKER QUESTIONS</b>                                                                                                                                                                                                                                                               |
| 25 | Abdul travelled 300 km by train and 200 km by taxi, it took him 5 hours and 30 minutes. But if he travels 260 km by train and 240 km by taxi, he takes 6 minutes longer. Find the speed of the train and that of the taxi.                                                              |
| 26 | 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. Find the speed of the stream and that of the boat in still water.                                                                                               |
| 27 | Solve the system of linear equations: $x + y = 4$ and $3x - 2y = -3$ , graphically. Shade the region bounded by these lines and the $x$ – axis. Also find its area.                                                                                                                     |
| 28 | Places A and B are 80 km apart from each other on a highway. A car starts from A and another from B at the same time. If they move in the same direction, they meet in 8 hours and if they move in the opposite directions, they meet in 1 hour 20 minutes. Find the speed of the cars. |
| 29 | 8 men and 6 boys can finish a piece of work in one day while 2 men and 3 boys can finish it in 3 days. Find the time taken by one man alone and that by one boy alone to finish the work.                                                                                               |
| 30 | 3 women and 4 girls can do a piece of work in 14 days, while 4 women and 6 girls can do it in 10 days. How long would it take 1 woman to finish the work?                                                                                                                               |

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|    | <b>HOTS</b>                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 31 | Solve the given system of equations by cross multiplication method:<br>$(a^3 + b^3)x - (a^3 - b^3)y = 0;$ $x + y - 2a^2 = 0$                                                                                                                                                                                                                                                                                                |
| 32 | Solve for x and y:<br>$ax + by - a + b = 0$ and $bx - ay - a - b = 0$                                                                                                                                                                                                                                                                                                                                                       |
| 33 | Solve the system of equations: $\frac{bx}{a} - \frac{ay}{b} + a + b = 0;$ $bx - ay + 2ab = 0$                                                                                                                                                                                                                                                                                                                               |
| 34 | A railway half-ticket costs half the full fare but the reservation charges are the same of a half-ticket as on a full ticket. One reserved first-class ticket from station A to station B costs Rs. 2125. Also one reserved first-class ticket and one reserved half first class ticket from station A to station B cost Rs. 3200. Find the full fare from station A to station B and the reservation charges for a ticket. |
| 35 | In $\Delta ABC$ , $\angle C = 3\angle B = 2(\angle A + \angle B)$ . Find the three angles.                                                                                                                                                                                                                                                                                                                                  |