CLASS IX – MATHEMATICS

Chapter Test: Two Variables, One Line

(Ganita Manjari, Grade 9, Part II – Chapter 13)

Time: 1½ Hours **M. M.: 40**

General Instructions:

1. This paper contains 21 questions. All questions are compulsory.
2. This paper is divided into 5 sections: **A, B, C, D** and **E**.
3. In **Section A**, Questions no. **1** to **10** are MCQs and questions no. **11** and **12** are Assertion-Reason based questions of 1 mark each.
4. In **Section B**, Questions no. **13** to **16** are Very Short Answer type questions carrying 2 marks each.
5. In **Section C**, Questions no. **17** and **18** are Short Answer type questions carrying 3 marks each.
6. In **Section D**, Questions no. **19** and **20** are Long Answer type questions carrying 5 marks each.
7. In **Section E**, Question no. **21** is a case based question carrying 4 marks. Internal choice is provided in the 2 marks part of the case study.
8. There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D and 1 part of Section E.
9. Figures are not drawn to scale. Give reasons for your steps wherever required.
10. Use of calculator is **not** allowed.

Q. No.	Section – A	Marks
1.	If the equation $4y = 3x - 9$ is written in the form $3x + by + c = 0$, then (b, c) is (A) $(-4, -9)$ (B) $(4, 9)$ (C) $(-4, 9)$ (D) $(4, -9)$	**[1]**
2.	Which of the following ordered pairs is a solution of $3x + 2y = 16$? (A) $(2, 4)$ (B) $(4, 2)$ (C) $(5, 1)$ (D) $(3, 3)$	**[1]**
3.	The graph of the equation $7x - 3y = 0$ passes through the point (A) $(1, 7)$ (B) $(7, 1)$ (C) $(0, 0)$ (D) $(3, 1)$	**[1]**
4.	The slope of the line passing through the points $(2, -1)$ and $(5, 8)$ is (A) $1/3$ (B) -3 (C) 9 (D) 3	**[1]**
5.	The slope of the line $6x + 3y = 5$ is (A) 2 (B) -2 (C) $-1/2$ (D) $5/3$	**[1]**
6.	The line $2x - 3y = 12$ cuts the y-axis at the point (A) $(0, 4)$ (B) $(0, 12)$ (C) $(0, -4)$ (D) $(6, 0)$	**[1]**
7.	Which of the following pairs of equations has a unique solution? (A) $3x + 2y = 6$ and $6x + 4y = 12$ (B) $x - 2y = 4$ and $3x - 6y = 7$ (C) $3x + 2y = 6$ and $2x + 3y = 6$ (D) $x - 2y = 4$ and $3x - 6y = 12$	**[1]**
8.	The pair of equations $2x + ky = 5$ and $6x + 9y = 15$ has infinitely many solutions when k is (A) 6 (B) 9 (C) 2 (D) 3	**[1]**
9.	If $x + y = 13$ and $x - y = 5$, then the value of xy is (A) 45 (B) 36 (C) 117 (D) 18	**[1]**
10.	The lines $x = 3$ and $y = -2$ intersect at the point (A) $(3, -2)$ (B) $(-2, 3)$ (C) $(3, 2)$ (D) $(-3, -2)$	**[1]**

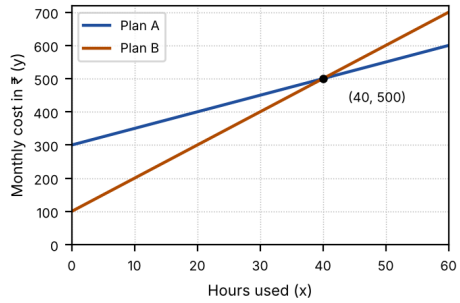
Q. No.	Section – A	Marks
	Questions number 11 and 12 are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer from the options (A), (B), (C) and (D) as given below. (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A). (C) Assertion (A) is true but Reason (R) is false. (D) Assertion (A) is false but Reason (R) is true.	
11.	**Assertion (A):** The pair $4x - 6y = 10$ and $2x - 3y = 5$ has infinitely many solutions. **Reason (R):** If $a_1/a_2 = b_1/b_2 = c_1/c_2$, the pair of equations has infinitely many solutions.	**[1]**
12.	**Assertion (A):** The equation $2x + 3y = 7$ has exactly one solution. **Reason (R):** A linear equation in two variables has infinitely many solutions.	**[1]**

Q. No.	Section – B	Marks
13.	If $(2, -3)$ is a solution of the equation $5x + ky = 22$, find the value of k.	**[2]**
14.	(A) Write the equation $6x - 3y = 9$ in the form $y = mx + d$ and hence find its slope and y-intercept. **OR** (B) Find the slope of the line passing through the points $(-3, 7)$ and $(1, -5)$. Does the line go upward or downward from left to right?	**[2]**
15.	Without solving, find whether the pair $5x - 2y = 7$ and $15x - 6y = 20$ has a unique solution, no solution or infinitely many solutions. Give a reason.	**[2]**
16.	(A) Solve by the substitution method: $x - y = 2$ and $3x + 2y = 21$. **OR** (B) Solve by the elimination method: $3x + y = 10$ and $x + y = 4$.	**[2]**

Q. No.	Section – C	Marks
17.	(A) Solve by the elimination method: $4x + 3y = 17$ and $5x - 2y = 4$. **OR** (B) Solve by the substitution method: $5x + 3y = 21$ and $2x - y = 4$.	**[3]**
18.	(A) A taxi charges a fixed amount plus a fixed amount per kilometre. The fare for 6 km is ₹115 and the fare for 10 km is ₹175. Find the fixed charge, the charge per km, and the fare for 14 km. **OR** (B) The sum of the digits of a two-digit number is 11. The number exceeds the number formed by reversing its digits by 27. Find the number.	**[3]**

Q. No.	Section – D	Marks
19.	(A) Solve graphically: $x + y = 5$ and $2x - y = 1$. Make a table of at least two points for each line, draw both lines on the same graph and read off the solution. [5] **OR** (B) The pair of equations is $2x + 3y = 7$ and $4x + ky = m$. Find the values of k and m for which the pair has (i) infinitely many solutions [2]; (ii) no solution (give one possible pair of values) [2]; (iii) a unique solution (give one value of k) [1].	**[5]**

Q. No.	Section – D	Marks
20.	(A) Five years ago, Mrs Rao was 7 times as old as her son. Five years from now, she will be 3 times as old as her son. Form a pair of linear equations, solve them, and find their present ages. Verify your answer. [2 + 2 + 1] **OR** (B) The perimeter of a rectangular field is 52 m and its length is 6 m more than its width. (i) Form a pair of linear equations in the length l and the width w. [2] (ii) Solve them to find the length and the width. [2] (iii) Find the area of the field. [1]	**[5]**

Q. No.	Section – E	Marks
21.	**Case Study:** A gym offers two monthly plans. **Plan A:** a fixed fee of ₹300 plus ₹5 for every hour used. **Plan B:** a fixed fee of ₹100 plus ₹10 for every hour used. Let x be the number of hours used in a month and y the monthly cost in ₹. The graph shows both plans.  (i) Write the equation of the cost y for each plan. **[1]** (ii) For how many hours is the monthly cost the same for both plans? What is that cost? **[1]** (iii) (A) Which plan is cheaper for 25 hours of use, and by how much? For what number of hours is Plan A cheaper than Plan B? **[2]** **OR** (iii) (B) Find the slope and the y-intercept of the line for each plan. What does the slope tell you about the plan? **[2]**	**[4]**