Mathematics — Ganita Manjari

Chapter 13 Test 10

Two Variables, One Line

Class IX | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. Choose one option in A; show working in B–D.
2. No calculators. Give exact answers unless an approximation is requested.
3. Read the scales on graphs carefully. Other diagrams are not necessarily to scale.

SECTION A

(5 questions × 1 mark = 5 marks)

1. Which point satisfies $kx + y = 2k + 3$ for every real value of k?

(A) $(3,2)$ (B) $(2,3)$
(C) $(2,0)$ (D) $(0,3)$

2. Which of $3x = 1$ and $y = 2x$ is satisfied exactly by $(0.33,0.66)$?

(A) Both equations (B) Only the first
(C) Only the second (D) Neither equation

3. Which equation supplies new information when combined with $2x + y = 7$?

(A) $4x + 2y = 14$ (B) $-2x - y = -7$
(C) $x + y = 5$ (D) $6x + 3y = 21$

4. A rectangle has variable length x, width y and fixed area 24. Which description is correct?

(A) $xy = 24$, nonlinear (B) $x + y = 24$, linear
(C) $xy = 24$, linear (D) $2x + 2y = 24$, linear

5. Move $y = 2x + 1$ three units to the right. Which is the new line?

(A) $y = 2x + 4$ (B) $y = 2x + 7$
(C) $y = 2x - 2$ (D) $y = 2x - 5$

SECTION B

(4 questions × 2 marks = 8 marks)

6. The table in figure is intended for $y = 3x + 3$ and has exactly one wrong y-value. Correct it and state the corrected ordered pair.

x	−2	−1	1	3
y	−3	0	6	13

7. The line $ax + by = 10$ passes through $(1,4)$ and $(3,2)$. Find a and b.

8. List all solutions of $2x + y = 9$ for which both coordinates are positive integers. How many are there?

9. Do the three lines $x + y = 7$, $2x - y = 2$ and $3x + y = 13$ share one common point? Justify.

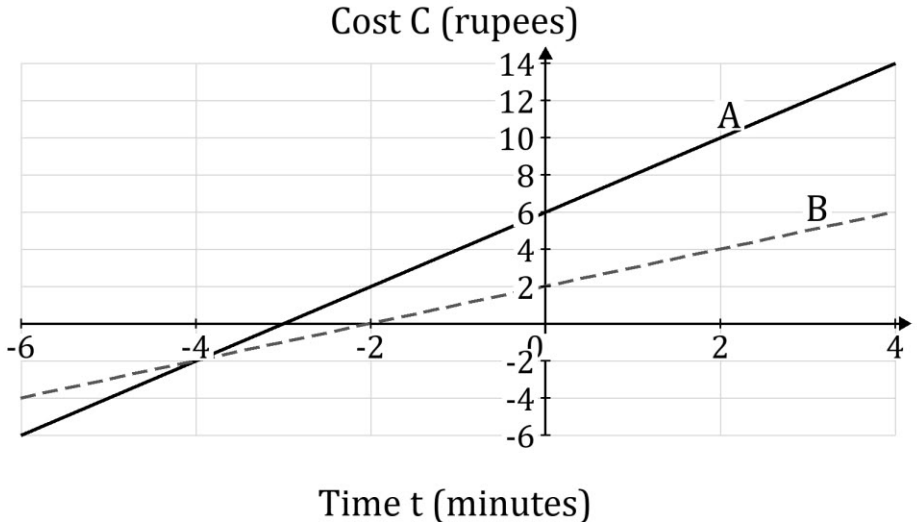
SECTION C

(3 questions × 3 marks = 9 marks)

10. Explain why multiplying a linear equation by a nonzero constant preserves all its solutions. Why must the constant be nonzero?

11. Prove that $y = mx + p$ and $y = mx + q$ have no common point when $p \neq q$. What happens when $p = q$? Give one numerical example of each case.

12. The cost lines A and B in figure are extended to negative times. The models are valid only for $t \geq 0$. Read their intersection and explain whether equal costs are possible at a valid time.



SECTION D

(1 application question × 3 marks = 3 marks)

13. A clock first shows u minutes after 5 o'clock. Twenty minutes later, it shows v minutes after 6 o'clock. If $u = 5v$, find both clock readings.