

Linear Equations in Two Variables

MCQ Test, Set 01

Time: 30 minutes

Maximum marks: 25

Name: _____ Class: _____ Date: _____

- There are 25 questions. Each has exactly one correct answer: choose A, B, C or D.
- Each correct answer carries 1 mark. There is no negative marking.
- The key sheet and worked solutions are at the end of this test.

- If $(-5, 4)$ lies on the line $4x + ky = -12$, then $k =$
A. 2 **B.** -8 **C.** -2 **D.** 8
- Which point lies on the line $5x + 3y = -6$?
A. $(3, -3)$ **B.** $(3, 3)$ **C.** $(-3, 3)$ **D.** $(-3, -3)$
- The pair $4x + y = -19$ and $3x + y = -13$ has
A. exactly two solutions **B.** a unique solution
C. no solution **D.** infinitely many solutions
- The lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ intersect at one point when
A. $\frac{a_1}{a_2} = \frac{c_1}{c_2} \neq \frac{b_1}{b_2}$ **B.** $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$
C. $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ **D.** $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
- Which equation, taken with $3x - 4y = 3$, makes a pair with no solution?
A. $6x - 8y = 4$ **B.** $6x - 8y = 6$ **C.** $-8x + 6y = 6$ **D.** $6x + 8y = 6$
- The pair $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has no solution when
A. $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ **B.** $\frac{a_1}{a_2} = \frac{c_1}{c_2} \neq \frac{b_1}{b_2}$
C. $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ **D.** $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
- The pair $x + 2y = -8$, $kx + 8y = -32$ has infinitely many solutions when $k =$
A. $-\frac{1}{4}$ **B.** -4 **C.** $\frac{1}{4}$ **D.** 4
- The pair $6x - 4y = 18$ and $3x - 2y = 9$ has
A. infinitely many solutions **B.** no solution
C. a unique solution **D.** exactly two solutions
- Solving $x - 5y = -5$ and $x + y = 7$ by the substitution method, $(x, y) =$
A. $(5, 2)$ **B.** $(10, 3)$ **C.** $(-15, 2)$ **D.** $(-5, 2)$
- From $7x + y = -8$, $y =$
A. $-8 + 7x$ **B.** $8 - 7x$ **C.** $8 + 7x$ **D.** $-8 - 7x$

11. Solving $9x + 2y = 15$ and $3x + 4y = 15$ by the elimination method, $y =$
A. -3 **B.** 3 **C.** 1 **D.** -1
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12. To eliminate x from (1) $5x + 5y = 6$ and (2) $6x - 9y = 2$, we multiply
A. (1) by 5 and (2) by 6 **B.** (1) by 6 and (2) by 5
C. (1) by 5 and (2) by 9 **D.** (1) by 9 and (2) by 5
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13. Solving $4x - 3y = -19$ and $3x + 4y = 17$ by the cross multiplication method, $(x, y) =$
A. $(-\frac{17}{2}, 5)$ **B.** $(5, -1)$ **C.** $(-1, -5)$ **D.** $(-1, 5)$
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14. If $\frac{x}{-34} = \frac{y}{85} = \frac{1}{17}$, then $(x, y) =$
A. $(-2, 5)$ **B.** $(5, -2)$ **C.** $(2, 5)$ **D.** $(-2, -5)$
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15. The solution of $2x - 4y = -10$ and $\frac{3x}{5} - y = -2$ is $(x, y) =$
A. $(-5, 5)$ **B.** $(5, 5)$ **C.** $(5, -5)$ **D.** $(-15, 5)$
-
16. $3x - \frac{y}{3} = -2$ without fractions is
A. $3x - 3y = -6$ **B.** $9x + y = -6$ **C.** $9x - y = -6$ **D.** $9x - y = -2$
-
17. The solution of $\frac{2}{x} - \frac{5}{y} = 13$ and $\frac{3}{x} - \frac{4}{y} = 16$ is $(x, y) =$
A. $(-\frac{1}{4}, -1)$ **B.** $(\frac{1}{4}, 1)$ **C.** $(4, -1)$ **D.** $(\frac{1}{4}, -1)$
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18. With $\frac{1}{x} = p$ and $\frac{1}{y} = q$, the equation $\frac{6}{x} + \frac{2}{y} = 9$ becomes
A. $6p - 2q = 9$ **B.** $2p + 6q = 9$
C. $6p + 2q = 9$ **D.** $\frac{p}{6} + \frac{q}{2} = 9$
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19. The solution of $\frac{3}{x} + 2y = 3$ and $\frac{3}{x} + y = 1$ is $(x, y) =$
A. $(2, -3)$ **B.** $(-3, -2)$ **C.** $(3, 2)$ **D.** $(-3, 2)$
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20. With $\frac{1}{x} = p$, the equation $\frac{6}{x} - 4y = 5$ becomes
A. $6p - 4y = 5$ **B.** $\frac{p}{6} - 4y = 5$ **C.** $6p + 4y = 5$ **D.** $\frac{6}{p} - 4y = 5$
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21. If $\frac{1}{x-2} = \frac{1}{6}$, then $x =$
A. 6 **B.** 4 **C.** 8 **D.** $\frac{13}{6}$
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22. $\frac{x+3y}{xy} =$
A. $\frac{1}{y} - \frac{3}{x}$ **B.** $\frac{1}{x} + \frac{3}{y}$
C. $\frac{1}{x} - \frac{3}{y}$ **D.** $\frac{1}{y} + \frac{3}{x}$
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23. The solution of $\frac{4x+2y}{xy} = 13$ and $\frac{3x+2y}{xy} = 10$ is $(x, y) =$
A. $(\frac{1}{2}, 3)$ **B.** $(2, \frac{1}{3})$ **C.** $(2, -\frac{1}{3})$ **D.** $(-2, \frac{1}{3})$
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24. If $\frac{4}{\sqrt{x}} = \frac{4}{7}$, then $x =$
A. 49 **B.** 7 **C.** 14 **D.** $\frac{49}{4}$
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25. The solution of $\frac{3}{\sqrt{x}} + \frac{4}{\sqrt{y}} = 3$ and $\frac{3}{\sqrt{x}} - \frac{4}{\sqrt{y}} = -1$ is $(x, y) =$

A. (6, 4)

B. (4, 9)

C. (9, 4)

D. (3, 2)

Key sheet

1. A	2. C	3. B	4. D	5. A
6. C	7. D	8. A	9. A	10. D
11. B	12. B	13. D	14. A	15. B
16. C	17. D	18. C	19. D	20. A
21. C	22. D	23. B	24. A	25. C

Solutions

1. If $(-5, 4)$ lies on the line $4x + ky = -12$, then $k =$

Put $x = -5, y = 4$: $4(-5) + k(4) = -12$

$$\Rightarrow -20 + 4k = -12$$

$$\Rightarrow 4k = -12 + 20 = 8$$

$$\Rightarrow k = 2$$

Ans: (A) 2

2. Which point lies on the line $5x + 3y = -6$?

Put each point in $5x + 3y$; only $(-3, 3)$ gives -6 :

$$5(-3) + 3(3) = -15 + 9 = -6$$

Ans: (C) $(-3, 3)$

3. The pair $4x + y = -19$ and $3x + y = -13$ has

$$\frac{a_1}{a_2} = \frac{4}{3}, \frac{b_1}{b_2} = \frac{1}{1} = 1, \frac{c_1}{c_2} = \frac{-19}{-13} = \frac{19}{13}$$

$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$, so the lines intersect: a unique solution.

Ans: (B) a unique solution

4. The lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ intersect at one point when

Intersecting lines (one common point): $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$, a unique solution.

Ans: (D) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

5. Which equation, taken with $3x - 4y = 3$, makes a pair with no solution?

With $6x - 8y = 4$: $\frac{a_1}{a_2} = \frac{3}{6} = \frac{1}{2}, \frac{b_1}{b_2} = \frac{-4}{-8} = \frac{1}{2}, \frac{c_1}{c_2} = \frac{3}{4}$

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$, so the lines are parallel: no solution.

Ans: (A) $6x - 8y = 4$

6. The pair $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has no solution when

Parallel lines: $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$, no solution.

Ans: (C) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

7. The pair $x + 2y = -8, kx + 8y = -32$ has infinitely many solutions when $k =$

For infinitely many solutions: $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

$$\frac{1}{k} = \frac{2}{8}$$

$$\Rightarrow 2k = 8$$

$$\Rightarrow k = 4$$

Also $\frac{c_1}{c_2} = \frac{-8}{-32} = \frac{1}{4}$, equal to the other ratios.

Ans: (D) 4

8. The pair $6x - 4y = 18$ and $3x - 2y = 9$ has

$$\frac{a_1}{a_2} = \frac{6}{3} = 2, \frac{b_1}{b_2} = \frac{-4}{-2} = 2, \frac{c_1}{c_2} = \frac{18}{9} = 2$$

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}, \text{ so the lines coincide: infinitely many solutions.}$$

Ans: (A) infinitely many solutions

9. Solving $x - 5y = -5$ and $x + y = 7$ by the substitution method, $(x, y) =$

$$x - 5y = -5 \quad (1)$$

$$x + y = 7 \quad (2)$$

$$(1) \Rightarrow x = -5 + 5y$$

$$\text{Substitute in (2): } (-5 + 5y) + y = 7$$

$$\Rightarrow -5 + 5y + y = 7$$

$$\Rightarrow -5 + 6y = 7$$

$$\Rightarrow 6y = 7 + 5$$

$$\Rightarrow 6y = 12$$

$$\Rightarrow y = 2$$

$$(1) \Rightarrow x = -5 + 5(2) = 5$$

$$\therefore (x, y) = (5, 2)$$

Ans: (A) (5, 2)

10. From $7x + y = -8$, $y =$

$$7x + y = -8$$

$$\text{Move the } x \text{ term to the right: } y = -8 - 7x$$

Ans: (D) $-8 - 7x$

11. Solving $9x + 2y = 15$ and $3x + 4y = 15$ by the elimination method, $y =$

$$9x + 2y = 15 \quad (1)$$

$$3x + 4y = 15 \quad (2)$$

$$(1) \Rightarrow 9x + 2y = 15$$

$$(2) \times 3 \Rightarrow 9x + 12y = 45$$

$$\text{Subtracting, } -10y = -30$$

$$\Rightarrow y = 3$$

$$(2) \Rightarrow 3x + 4(3) = 15$$

$$\Rightarrow 3x + 12 = 15$$

$$\Rightarrow 3x = 15 - 12$$

$$\Rightarrow 3x = 3$$

$$\Rightarrow x = 1$$

$$\therefore (x, y) = (1, 3)$$

Ans: (B) 3

12. To eliminate x from (1) $5x + 5y = 6$ and (2) $6x - 9y = 2$, we multiply

The LCM of 5 and 6 is 30.

$$(1) \times 6 \Rightarrow 30x + 30y = 36$$

$$(2) \times 5 \Rightarrow 30x - 45y = 10$$

Now the x terms are equal, and subtracting removes x .

Ans: (B) (1) by 6 and (2) by 5

13. Solving $4x - 3y = -19$ and $3x + 4y = 17$ by the cross multiplication method, $(x, y) =$

$$4x - 3y + 19 = 0 \quad (1)$$

$$3x + 4y - 17 = 0 \quad (2)$$

$$\frac{x}{b_1c_2 - b_2c_1} = \frac{y}{c_1a_2 - c_2a_1} = \frac{1}{a_1b_2 - a_2b_1}$$

$$\frac{x}{51 - 76} = \frac{y}{57 + 68} = \frac{1}{16 + 9}$$

$$\frac{x}{-25} = \frac{y}{125} = \frac{1}{25}$$

$$\Rightarrow x = \frac{-25}{25}, y = \frac{125}{25}$$

$$\therefore (x, y) = (-1, 5)$$

Ans: (D) $(-1, 5)$

14. If $\frac{x}{-34} = \frac{y}{85} = \frac{1}{17}$, then $(x, y) =$

$$x = \frac{-34}{17} = -2$$

$$y = \frac{85}{17} = 5$$

Ans: (A) $(-2, 5)$

15. The solution of $2x - 4y = -10$ and $\frac{3x}{5} - y = -2$ is $(x, y) =$

$$2x - 4y = -10 \quad (1)$$

$$\frac{3x}{5} - y = -2 \Rightarrow \frac{3x - 5y}{5} = -2 \Rightarrow 3x - 5y = -10 \quad (2)$$

$$(1) \times 3 \Rightarrow 6x - 12y = -30$$

$$(2) \times 2 \Rightarrow 6x - 10y = -20$$

Subtracting, $-2y = -10$

$$\Rightarrow y = 5$$

$$(1) \Rightarrow 2x - 4(5) = -10$$

$$\Rightarrow 2x - 20 = -10$$

$$\Rightarrow 2x = -10 + 20$$

$$\Rightarrow 2x = 10$$

$$\Rightarrow x = 5$$

$$\therefore (x, y) = (5, 5)$$

Ans: (B) $(5, 5)$

16. $3x - \frac{y}{3} = -2$ without fractions is

Multiply every term by the LCM 3:

$$3x - \frac{y}{3} = -2 \Rightarrow \frac{9x - y}{3} = -2 \Rightarrow 9x - y = -6$$

Ans: (C) $9x - y = -6$

17. The solution of $\frac{2}{x} - \frac{5}{y} = 13$ and $\frac{3}{x} - \frac{4}{y} = 16$ is $(x, y) =$

Let $\frac{1}{x} = p$ and $\frac{1}{y} = q$.

$$2p - 5q = 13 \quad (1)$$

$$3p - 4q = 16 \quad (2)$$

$$(1) \times 3 \Rightarrow 6p - 15q = 39$$

$$(2) \times 2 \Rightarrow 6p - 8q = 32$$

Subtracting, $-7q = 7$

$$\Rightarrow q = -1$$

$$(1) \Rightarrow 2p - 5(-1) = 13$$

$$\Rightarrow 2p + 5 = 13$$

$$\Rightarrow 2p = 13 - 5$$

$$\Rightarrow 2p = 8$$

$$\Rightarrow p = 4$$

$$\therefore (p, q) = (4, -1)$$

$$\frac{1}{x} = 4 \Rightarrow x = \frac{1}{4}$$

$$\frac{1}{y} = -1 \Rightarrow y = -1$$

$$\therefore (x, y) = \left(\frac{1}{4}, -1\right)$$

Ans: (D) $\left(\frac{1}{4}, -1\right)$

18. With $\frac{1}{x} = p$ and $\frac{1}{y} = q$, the equation $\frac{6}{x} + \frac{2}{y} = 9$ becomes

$$\frac{6}{x} = 6 \times \frac{1}{x} = 6p \text{ and } \frac{2}{y} = 2q$$

$$\text{So } 6p + 2q = 9$$

Ans: (C) $6p + 2q = 9$

19. The solution of $\frac{3}{x} + 2y = 3$ and $\frac{3}{x} + y = 1$ is $(x, y) =$

Let $\frac{1}{x} = p$.

$$3p + 2y - 3 = 0 \quad (1)$$

$$3p + y - 1 = 0 \quad (2)$$

$$\frac{p}{b_1c_2 - b_2c_1} = \frac{y}{c_1a_2 - c_2a_1} = \frac{1}{a_1b_2 - a_2b_1}$$

$$\frac{p}{-2+3} = \frac{y}{-9+3} = \frac{1}{3-6}$$

$$\frac{p}{1} = \frac{y}{-6} = \frac{1}{-3}$$

$$\Rightarrow p = \frac{1}{-3}, y = \frac{-6}{-3}$$

$$\therefore (p, y) = \left(-\frac{1}{3}, 2\right)$$

$$\frac{1}{x} = -\frac{1}{3} \Rightarrow x = -3$$

$$\therefore (x, y) = (-3, 2)$$

Ans: (D) $(-3, 2)$

20. With $\frac{1}{x} = p$, the equation $\frac{6}{x} - 4y = 5$ becomes

$$\frac{6}{x} = 6 \times \frac{1}{x} = 6p$$

$$\text{So } 6p - 4y = 5$$

Ans: (A) $6p - 4y = 5$

21. If $\frac{1}{x-2} = \frac{1}{6}$, then $x =$
 $\frac{1}{x-2} = \frac{1}{6} \Rightarrow x - 2 = 6$
 $\Rightarrow x = 8$

Ans: (C) 8

22. $\frac{x+3y}{xy} =$
Divide each term by xy : $\frac{x+3y}{xy} = \frac{x}{xy} + \frac{3y}{xy}$
 $= \frac{1}{y} + \frac{3}{x}$
Ans: (D) $\frac{1}{y} + \frac{3}{x}$

23. The solution of $\frac{4x+2y}{xy} = 13$ and $\frac{3x+2y}{xy} = 10$ is $(x, y) =$
 $\frac{4x+2y}{xy} = 13 \Rightarrow \frac{4}{y} + \frac{2}{x} = 13$
 $\frac{3x+2y}{xy} = 10 \Rightarrow \frac{3}{y} + \frac{2}{x} = 10$
Let $\frac{1}{x} = p$ and $\frac{1}{y} = q$.
 $2p + 4q = 13$ (1)
 $2p + 3q = 10$ (2)
Subtracting, $q = 3$
(1) $\Rightarrow 2p + 4(3) = 13$
 $\Rightarrow 2p + 12 = 13$
 $\Rightarrow 2p = 13 - 12$
 $\Rightarrow 2p = 1$
 $\Rightarrow p = \frac{1}{2}$
 $\therefore (p, q) = (\frac{1}{2}, 3)$
 $\frac{1}{x} = \frac{1}{2} \Rightarrow x = 2$
 $\frac{1}{y} = 3 \Rightarrow y = \frac{1}{3}$
 $\therefore (x, y) = (2, \frac{1}{3})$
Ans: (B) $(2, \frac{1}{3})$

24. If $\frac{4}{\sqrt{x}} = \frac{4}{7}$, then $x =$
 $\sqrt{x} = 7$
 $\Rightarrow x = 7^2 = 49$
Ans: (A) 49

25. The solution of $\frac{3}{\sqrt{x}} + \frac{4}{\sqrt{y}} = 3$ and $\frac{3}{\sqrt{x}} - \frac{4}{\sqrt{y}} = -1$ is $(x, y) =$

Let $\frac{1}{\sqrt{x}} = p$ and $\frac{1}{\sqrt{y}} = q$.

$$3p + 4q = 3 \quad (1)$$

$$3p - 4q = -1 \quad (2)$$

Subtracting, $8q = 4$

$$\Rightarrow q = \frac{1}{2}$$

$$(1) \Rightarrow 3p + 4\left(\frac{1}{2}\right) = 3$$

$$\Rightarrow 3p + 2 = 3$$

$$\Rightarrow 3p = 3 - 2$$

$$\Rightarrow 3p = 1$$

$$\Rightarrow p = \frac{1}{3}$$

$$\therefore (p, q) = \left(\frac{1}{3}, \frac{1}{2}\right)$$

$$\frac{1}{\sqrt{x}} = \frac{1}{3} \Rightarrow \sqrt{x} = 3 \Rightarrow x = 9$$

$$\frac{1}{\sqrt{y}} = \frac{1}{2} \Rightarrow \sqrt{y} = 2 \Rightarrow y = 4$$

$$\therefore (x, y) = (9, 4)$$

Ans: (C) (9, 4)
