

Linear Equations in Two Variables

MCQ Test, Set 08

Time: 30 minutes

Maximum marks: 25

Name: _____ Class: _____ Date: _____

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

1. If $y = 4$ in $5x + y = -16$, then $x =$
A. -20 **B.** 4 **C.** $-\frac{12}{5}$ **D.** -4
2. Which point lies on the line $3x + 5y = 5$?
A. $(-2, 5)$ **B.** $(5, -2)$ **C.** $(-5, -2)$ **D.** $(5, 2)$
3. The pair $2x - 3y = 22$ and $4x + 3y = 8$ has
A. no solution **B.** infinitely many solutions
C. a unique solution **D.** exactly two solutions
4. Which equation, taken with $3x - y = 5$, makes a pair with no solution?
A. $-2x + 6y = 10$ **B.** $6x - 2y = 10$ **C.** $6x + 2y = 10$ **D.** $6x - 2y = 11$
5. The pair $5x + 2y = 5$ and $20x + 8y = -12$ has
A. exactly two solutions **B.** no solution
C. infinitely many solutions **D.** a unique solution
6. The pair $20x - 12y = -28$ and $10x - 6y = -14$ has
A. no solution **B.** infinitely many solutions
C. a unique solution **D.** exactly two solutions
7. Which equation, taken with $6x + 3y = 5$, makes a pair with infinitely many solutions?
A. $18x + 9y = 15$ **B.** $9x + 18y = 15$ **C.** $18x + 9y = 12$ **D.** $18x - 9y = 15$
8. Substituting $y = 8 - 5x$ in $7x + 3y = 16$ gives
A. $-8x + 24 = 16$ **B.** $22x + 24 = 16$ **C.** $2x + 8 = 16$ **D.** $-15x + 24 = 16$
9. From $x - 7y = -7$, $x =$
A. $7 + 7y$ **B.** $7 - 7y$ **C.** $-7 - 7y$ **D.** $-7 + 7y$
10. Solving $3x - 4y = -13$ and $9x + 4y = 25$ by the elimination method, $y =$
A. -4 **B.** 1 **C.** 8 **D.** 4

11. Solving $3x - 5y = 7$ and $x - 2y = 2$ by the elimination method, $(x, y) =$
A. $(-4, -1)$ **B.** $(-4, 1)$ **C.** $(4, 1)$ **D.** $(1, 4)$
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12. To eliminate x from (1) $7x - 2y = 12$ and (2) $4x + 5y = -2$, we multiply
A. (1) by 2 and (2) by 5 **B.** (1) by 4 and (2) by 7
C. (1) by 7 and (2) by 4 **D.** (1) by 5 and (2) by 2
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13. For $5x - 4y + 35 = 0$ and $3x - 5y + 34 = 0$, in the cross multiplication method $a_1b_2 - a_2b_1 =$
A. 39 **B.** -13 **C.** -37 **D.** 13
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14. Solving $5x + 2y = 35$ and $5x - y = 20$ by the cross multiplication method, $(x, y) =$
A. $(5, 5)$ **B.** $(9, 5)$ **C.** $(-5, 5)$ **D.** $(1, 15)$
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15. $\frac{3x}{5} - 2y = -6$ without fractions is
A. $15x - 2y = -30$ **B.** $3x - 10y = -30$ **C.** $3x + 10y = -30$ **D.** $3x - 10y = -6$
-
16. The solution of $6x - 4y = 10$ and $2x + \frac{3y}{5} = 13$ is $(x, y) =$
A. $(5, 5)$ **B.** $(-5, -5)$ **C.** $(5, -5)$ **D.** $(-5, 5)$
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17. With $\frac{1}{x} = p$ and $\frac{1}{y} = q$, the equation $\frac{5}{x} - \frac{1}{y} = 1$ becomes
A. $-p + 5q = 1$ **B.** $5p - q = 1$ **C.** $5p + q = 1$ **D.** $\frac{p}{5} - q = 1$
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18. The solution of $\frac{5}{x} - \frac{3}{y} = -4$ and $\frac{3}{x} - \frac{3}{y} = -2$ is $(x, y) =$
A. $(-1, -3)$ **B.** $(-3, -1)$ **C.** $(-1, 3)$ **D.** $(1, -3)$
-
19. With $\frac{1}{x} = p$, the equation $\frac{6}{x} - 7y = -4$ becomes
A. $\frac{p}{6} - 7y = -4$ **B.** $6p + 7y = -4$ **C.** $6p - 7y = -4$ **D.** $\frac{6}{p} - 7y = -4$
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20. If $\frac{1}{x-1} = -\frac{1}{3}$, then $x =$
A. -2 **B.** -3 **C.** -4 **D.** $\frac{2}{3}$
-
21. The solution of $\frac{4}{x-3} + \frac{1}{y-1} = 5$ and $\frac{3}{x-3} - \frac{2}{y-1} = 1$ is $(x, y) =$
A. $(2, 4)$ **B.** $(-2, 0)$ **C.** $(4, 2)$ **D.** $(1, 1)$
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22. The solution of $\frac{3x-5y}{xy} = -4$ and $\frac{3x+4y}{xy} = 5$ is $(x, y) =$
A. $(-1, 3)$ **B.** $(1, -3)$ **C.** $(3, 1)$ **D.** $(1, 3)$
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23. $\frac{x+8y}{xy} =$
A. $\frac{1}{x} + \frac{8}{y}$ **B.** $\frac{1}{y} - \frac{8}{x}$
C. $\frac{1}{x} - \frac{8}{y}$ **D.** $\frac{1}{y} + \frac{8}{x}$
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24. The solution of $\frac{2}{\sqrt{x}} - \frac{3}{\sqrt{y}} = -1$ and $\frac{4}{\sqrt{x}} + \frac{4}{\sqrt{y}} = 3$ is $(x, y) =$
A. $(16, 2)$ **B.** $(4, 2)$ **C.** $(16, 4)$ **D.** $(8, 4)$
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25. If $\frac{4}{\sqrt{x}} = 2$, then $x =$

A. $\frac{1}{4}$

B. 4

C. 2

D. 1

Key sheet

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

Solutions

1. If $y = 4$ in $5x + y = -16$, then $x =$

$$5x + (4) = -16$$

$$\Rightarrow 5x + 4 = -16$$

$$\Rightarrow 5x = -16 - 4 = -20$$

$$\Rightarrow x = -4$$

Ans: (D) -4

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

Put each point in $3x + 5y$; only $(5, -2)$ gives 5:

$$3(5) + 5(-2) = 15 - 10 = 5$$

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

3. The pair $2x - 3y = 22$ and $4x + 3y = 8$ has

$$\frac{a_1}{a_2} = \frac{2}{4} = \frac{1}{2}, \frac{b_1}{b_2} = \frac{-3}{3} = -1, \frac{c_1}{c_2} = \frac{22}{8} = \frac{11}{4}$$

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

Ans: (C) a unique solution

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

$$\text{With } 6x - 2y = 11: \frac{a_1}{a_2} = \frac{3}{6} = \frac{1}{2}, \frac{b_1}{b_2} = \frac{-1}{-2} = \frac{1}{2}, \frac{c_1}{c_2} = \frac{5}{11}$$

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

Ans: (D) $6x - 2y = 11$

5. The pair $5x + 2y = 5$ and $20x + 8y = -12$ has

$$\frac{a_1}{a_2} = \frac{5}{20} = \frac{1}{4}, \frac{b_1}{b_2} = \frac{2}{8} = \frac{1}{4}, \frac{c_1}{c_2} = \frac{5}{-12} = -\frac{5}{12}$$

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

Ans: (B) no solution

6. The pair $20x - 12y = -28$ and $10x - 6y = -14$ has

$$\frac{a_1}{a_2} = \frac{20}{10} = 2, \frac{b_1}{b_2} = \frac{-12}{-6} = 2, \frac{c_1}{c_2} = \frac{-28}{-14} = 2$$

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

Ans: (B) infinitely many solutions

7. Which equation, taken with $6x + 3y = 5$, makes a pair with infinitely many solutions?

$$\text{With } 18x + 9y = 15: \frac{a_1}{a_2} = \frac{6}{18} = \frac{1}{3}, \frac{b_1}{b_2} = \frac{3}{9} = \frac{1}{3}, \frac{c_1}{c_2} = \frac{5}{15} = \frac{1}{3}$$

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

Ans: (A) $18x + 9y = 15$

8. Substituting $y = 8 - 5x$ in $7x + 3y = 16$ gives

$$7x + 3(8 - 5x) = 16$$

$$\Rightarrow 7x + 24 - 15x = 16$$

$$\Rightarrow -8x + 24 = 16$$

Ans: (A) $-8x + 24 = 16$

9. From $x - 7y = -7$, $x =$

$$x - 7y = -7$$

Move the y term to the right: $x = -7 + 7y$

Ans: (D) $-7 + 7y$

10. Solving $3x - 4y = -13$ and $9x + 4y = 25$ by the elimination method, $y =$

$$3x - 4y = -13 \quad (1)$$

$$9x + 4y = 25 \quad (2)$$

$$(1) \times 3 \Rightarrow 9x - 12y = -39$$

$$(2) \Rightarrow 9x + 4y = 25$$

Subtracting, $-16y = -64$

$$\Rightarrow y = 4$$

$$(1) \Rightarrow 3x - 4(4) = -13$$

$$\Rightarrow 3x - 16 = -13$$

$$\Rightarrow 3x = -13 + 16$$

$$\Rightarrow 3x = 3$$

$$\Rightarrow x = 1$$

$$\therefore (x, y) = (1, 4)$$

Ans: (D) 4

11. Solving $3x - 5y = 7$ and $x - 2y = 2$ by the elimination method, $(x, y) =$

$$3x - 5y = 7 \quad (1)$$

$$x - 2y = 2 \quad (2)$$

$$(1) \Rightarrow 3x - 5y = 7$$

$$(2) \times 3 \Rightarrow 3x - 6y = 6$$

Subtracting, $y = 1$

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

$$\Rightarrow x - 2 = 2$$

$$\Rightarrow x = 2 + 2$$

$$\Rightarrow x = 4$$

$$\therefore (x, y) = (4, 1)$$

Ans: (C) (4, 1)

12. To eliminate x from (1) $7x - 2y = 12$ and (2) $4x + 5y = -2$, we multiply

The LCM of 7 and 4 is 28.

$$(1) \times 4 \Rightarrow 28x - 8y = 48$$

$$(2) \times 7 \Rightarrow 28x + 35y = -14$$

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

Ans: (B) (1) by 4 and (2) by 7

13. For $5x - 4y + 35 = 0$ and $3x - 5y + 34 = 0$, in the cross multiplication method $a_1b_2 - a_2b_1 =$

$$a_1b_2 - a_2b_1 = (5)(-5) - (3)(-4) = -25 + 12 = -13$$

Ans: (B) -13

14. Solving $5x + 2y = 35$ and $5x - y = 20$ by the cross multiplication method, $(x, y) =$

$$5x + 2y - 35 = 0 \quad (1)$$

$$5x - y - 20 = 0 \quad (2)$$

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

$$\frac{x}{-40 - 35} = \frac{y}{-175 + 100} = \frac{1}{-5 - 10}$$

$$\frac{x}{-75} = \frac{y}{-75} = \frac{1}{-15}$$

$$\Rightarrow x = \frac{-75}{-15}, y = \frac{-75}{-15}$$

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

Ans: (A) (5, 5)

15. $\frac{3x}{5} - 2y = -6$ without fractions is

Multiply every term by the LCM 5:

$$\frac{3x}{5} - 2y = -6 \Rightarrow \frac{3x - 10y}{5} = -6 \Rightarrow 3x - 10y = -30$$

Ans: (B) $3x - 10y = -30$

16. The solution of $6x - 4y = 10$ and $2x + \frac{3y}{5} = 13$ is $(x, y) =$

$$6x - 4y = 10 \quad (1)$$

$$2x + \frac{3y}{5} = 13 \Rightarrow \frac{10x + 3y}{5} = 13 \Rightarrow 10x + 3y = 65 \quad (2)$$

$$(1) \times 5 \Rightarrow 30x - 20y = 50$$

$$(2) \times 3 \Rightarrow 30x + 9y = 195$$

$$\text{Subtracting, } -29y = -145$$

$$\Rightarrow y = 5$$

$$(1) \Rightarrow 6x - 4(5) = 10$$

$$\Rightarrow 6x - 20 = 10$$

$$\Rightarrow 6x = 10 + 20$$

$$\Rightarrow 6x = 30$$

$$\Rightarrow x = 5$$

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

Ans: (A) (5, 5)

17. With $\frac{1}{x} = p$ and $\frac{1}{y} = q$, the equation $\frac{5}{x} - \frac{1}{y} = 1$ becomes

$$\frac{5}{x} = 5 \times \frac{1}{x} = 5p \text{ and } \frac{1}{y} = 1q$$

$$\text{So } 5p - q = 1$$

$$\text{Ans: (B) } 5p - q = 1$$

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

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

$$5p - 3q = -4 \quad (1)$$

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

$$(1) \times 3 \Rightarrow 15p - 9q = -12$$

$$(2) \times 5 \Rightarrow 15p - 15q = -10$$

$$\text{Subtracting, } 6q = -2$$

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

$$(2) \Rightarrow 3p - 3(-\frac{1}{3}) = -2$$

$$\Rightarrow 3p + 1 = -2$$

$$\Rightarrow 3p = -2 - 1$$

$$\Rightarrow 3p = -3$$

$$\Rightarrow p = -1$$

$$\therefore (p, q) = (-1, -\frac{1}{3})$$

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

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

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

$$\text{Ans: (A) } (-1, -3)$$

19. With $\frac{1}{x} = p$, the equation $\frac{6}{x} - 7y = -4$ becomes

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

$$\text{So } 6p - 7y = -4$$

$$\text{Ans: (C) } 6p - 7y = -4$$

20. If $\frac{1}{x-1} = -\frac{1}{3}$, then $x =$

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

$$\Rightarrow x = -2$$

$$\text{Ans: (A) } -2$$

21. The solution of $\frac{4}{x-3} + \frac{1}{y-1} = 5$ and $\frac{3}{x-3} - \frac{2}{y-1} = 1$ is $(x, y) =$

Let $\frac{1}{x-3} = p$ and $\frac{1}{y-1} = q$.

$$4p + q = 5 \quad (1)$$

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

$$(1) \Rightarrow q = 5 - 4p$$

Substitute in (2): $3p - 2(5 - 4p) = 1$

$$\Rightarrow 3p - 10 + 8p = 1$$

$$\Rightarrow 11p - 10 = 1$$

$$\Rightarrow 11p = 1 + 10$$

$$\Rightarrow 11p = 11$$

$$\Rightarrow p = 1$$

$$(1) \Rightarrow q = 5 - 4(1) = 1$$

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

$$\frac{1}{x-3} = 1 \Rightarrow x - 3 = 1 \Rightarrow x = 4$$

$$\frac{1}{y-1} = 1 \Rightarrow y - 1 = 1 \Rightarrow y = 2$$

$$\therefore (x, y) = (4, 2)$$

Ans: (C) (4, 2)

22. The solution of $\frac{3x-5y}{xy} = -4$ and $\frac{3x+4y}{xy} = 5$ is $(x, y) =$

$$\frac{3x-5y}{xy} = -4 \Rightarrow \frac{3}{y} - \frac{5}{x} = -4$$

$$\frac{3x+4y}{xy} = 5 \Rightarrow \frac{3}{y} + \frac{4}{x} = 5$$

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

$$-5p + 3q = -4 \quad (1)$$

$$4p + 3q = 5 \quad (2)$$

Subtracting, $-9p = -9$

$$\Rightarrow p = 1$$

$$(1) \Rightarrow 3q - 5(1) = -4$$

$$\Rightarrow 3q - 5 = -4$$

$$\Rightarrow 3q = -4 + 5$$

$$\Rightarrow 3q = 1$$

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

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

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

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

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

Ans: (D) (1, 3)

23. $\frac{x+8y}{xy} =$

Divide each term by xy : $\frac{x+8y}{xy} = \frac{x}{xy} + \frac{8y}{xy}$

$$= \frac{1}{y} + \frac{8}{x}$$

Ans: (D) $\frac{1}{y} + \frac{8}{x}$

24. The solution of $\frac{2}{\sqrt{x}} - \frac{3}{\sqrt{y}} = -1$ and $\frac{4}{\sqrt{x}} + \frac{4}{\sqrt{y}} = 3$ is $(x, y) =$

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

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

$$4p + 4q = 3 \quad (2)$$

$$(1) \times 2 \Rightarrow 4p - 6q = -2$$

$$(2) \Rightarrow 4p + 4q = 3$$

Subtracting, $-10q = -5$

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

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

$$\Rightarrow 2p - \frac{3}{2} = -1$$

$$\Rightarrow 2p = -1 + \frac{3}{2}$$

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

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

$$\therefore (p, q) = \left(\frac{1}{4}, \frac{1}{2}\right)$$

$$\frac{1}{\sqrt{x}} = \frac{1}{4} \Rightarrow \sqrt{x} = 4 \Rightarrow x = 16$$

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

$$\therefore (x, y) = (16, 4)$$

Ans: (C) (16, 4)

25. If $\frac{4}{\sqrt{x}} = 2$, then $x =$

$$\sqrt{x} = 2$$

$$\Rightarrow x = 2^2 = 4$$

Ans: (B) 4
