

COMPETENCY-BASED WORKSHEET

Pair of Linear Equations in Two Variables

Class X | Mathematics | CBSE Board

Total Questions: 30 | Maximum Marks: 30 | Time Allowed: 1 Hour

Name: _____ Class/Sec: _____ Date: _____

General Instructions

- All questions are compulsory.
- Section A contains 20 Multiple Choice Questions (MCQs) of 1 mark each.
- Section B contains 10 Assertion-Reason Based Questions of 1 mark each.
- There is no negative marking.
- Write the correct option clearly in the space provided.

SECTION A — Multiple Choice Questions (MCQs)

Each question carries 1 mark. Choose the correct option.

Q1. A man rowing a boat covers 20 km downstream in 2 hours and 12 km upstream in 3 hours. What is the speed of the current?

- (a) 2 km/h
- (b) 3 km/h
- (c) 4 km/h
- (d) 1 km/h

Your Answer: _____

Q2. The pair of equations $x = a$ and $y = b$ graphically represents lines that are:

- (a) Parallel to each other
- (b) Coincident
- (c) Intersecting at (b, a)
- (d) Intersecting at (a, b)

Your Answer: _____

Q3. If $2x + 3y = 12$ and $(a + b)x + (2a - b)y = 36$ represent coincident lines, what is the value of $a + b$?

- (a) 5
- (b) 7
- (c) 3
- (d) 6

Your Answer: _____

Q4. The value of k for which the system $kx + 2y = 5$ and $3x + y = 1$ has NO solution is:

- (a) 3
- (b) $1/3$
- (c) 6
- (d) $2/3$

Your Answer: _____

Q5. The sum of the digits of a two-digit number is 9. If the digits are reversed, the new number is 27 more than the original. What is the original number?

- (a) 27
- (b) 36
- (c) 45

(d) 54

Your Answer: _____

Q6. If the lines $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, the value of k is:

(a) $15/4$

(b) $4/15$

(c) $-15/4$

(d) $5/4$

Your Answer: _____

Q7. A fraction becomes $1/3$ when 1 is subtracted from the numerator and it becomes $1/4$ when 8 is added to its denominator. The fraction is:

(a) $3/12$

(b) $4/12$

(c) $5/12$

(d) $3/8$

Your Answer: _____

Q8. For the equations $ax + by = c$ and $lx + my = n$ to have a unique solution, which condition must hold?

(a) $am = bl$

(b) $am \neq bl$

(c) $al = bm$

(d) $an = cm$

Your Answer: _____

Q9. Two lines are given: $3x - y = 8$ and $6x - 2y = 16$. The number of solutions of this system is:

(a) 0

(b) 1

(c) 2

(d) Infinitely many

Your Answer: _____

Q10. Five years ago, the age of a father was three times the age of his son. Five years hence, the father will be twice as old as his son. The present age of the father is:

(a) 40 years

(b) 45 years

(c) 50 years

(d) 35 years

Your Answer: _____

Q11. The area (in sq. units) of the triangle formed by the lines $x = 0$, $y = 0$ and $3x + 4y = 12$ is:

(a) 6

(b) 8

(c) 12

(d) 4

Your Answer: _____

Q12. If $(6, k)$ is a solution of the equation $3x + y - 22 = 0$, then $k =$

(a) -4

(b) 4

(c) 3

(d) -3

Your Answer: _____

Q13. The pair of linear equations $3x/2 + 5y/3 = 7$ and $9x + 10y = 14$ has:

(a) A unique solution

- (b) Infinitely many solutions
- (c) No solution
- (d) Exactly two solutions

Your Answer: _____

Q14. Ravi bought 3 notebooks and 2 pens for ₹80. Seema bought 5 notebooks and 3 pens for ₹130 from the same shop. The cost of one pen is:

- (a) ₹10
- (b) ₹15
- (c) ₹20
- (d) ₹25

Your Answer: _____

Q15. The lines represented by the equations $2x - 3y + 6 = 0$ and $4x - 6y + 12 = 0$ are:

- (a) Intersecting but not perpendicular
- (b) Perpendicular
- (c) Parallel and distinct
- (d) Coincident

Your Answer: _____

Q16. In a classroom, if 3 students sit on each bench, 1 student is left standing. If 4 students sit on each bench, 1 bench is left empty. How many students are there in the class?

- (a) 28
- (b) 30
- (c) 16
- (d) 40

Your Answer: _____

Q17. If $am \neq bl$, then the pair of equations $ax + by = c$ and $lx + my = n$ has:

- (a) No solution
- (b) Infinitely many solutions
- (c) Exactly one solution
- (d) Exactly two solutions

Your Answer: _____

Q18. The graph of the pair of linear equations $2x + 3y = 5$ and $4x + 6y = 10$ is represented by:

- (a) Two intersecting lines
- (b) Two parallel lines
- (c) Two coincident lines
- (d) One line and a curve

Your Answer: _____

Q19. A boat goes 30 km upstream and 44 km downstream in 10 hours. It also goes 40 km upstream and 55 km downstream in 13 hours. The speed of the stream (in km/h) is:

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Your Answer: _____

Q20. If the system of equations $2x + 3y = 7$ and $(a + b)x + (2a - b)y = 21$ has infinitely many solutions, what is (a, b) ?

- (a) (1, 5)
- (b) (5, 1)
- (c) (3, 2)
- (d) (2, 3)

Your Answer: _____

SECTION B — Assertion-Reason Based Questions

Each question carries 1 mark. Read the assertion and reason carefully and select the correct option.

Directions: In each of the following questions, a statement of Assertion (A) is given followed by a corresponding statement of Reason (R). Select the correct option from the codes 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, but 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.

Q1.

Assertion (A): The pair of equations $2x + 3y = 5$ and $4x + 6y = 10$ has infinitely many solutions.

Reason (R): If $a_1/a_2 = b_1/b_2 = c_1/c_2$, then the pair of linear equations is consistent and has infinitely many solutions.

Your Answer: _____

Q2.

Assertion (A): The lines $3x - 4y + 5 = 0$ and $6x - 8y + 15 = 0$ are parallel.

Reason (R): Two lines are parallel if $a_1/a_2 = b_1/b_2 \neq c_1/c_2$, meaning they have the same slope but different y-intercepts.

Your Answer: _____

Q3.

Assertion (A): The system $x + 2y = 3$ and $2x + 4y = 7$ has no solution.

Reason (R): For no solution, the equations must represent two coincident lines.

Your Answer: _____

Q4.

Assertion (A): The point (2, 3) lies on the line $3x - 2y = 0$.

Reason (R): A point (x_1, y_1) lies on the line $ax + by + c = 0$ if and only if $ax_1 + by_1 + c = 0$.

Your Answer: _____

Q5.

Assertion (A): A pair of linear equations that is consistent may have either one solution or infinitely many solutions.

Reason (R): A pair of linear equations is consistent if the lines either intersect at one point (unique solution) or are coincident (infinitely many solutions).

Your Answer: _____

Q6.

Assertion (A): The value of k for which $kx + 3y - k - 3 = 0$ and $12x + ky - 3k = 0$ have infinitely many solutions is $k = 6$.

Reason (R): For infinitely many solutions, $a_1/a_2 = b_1/b_2 = c_1/c_2$ must be satisfied, and $k = 6$ satisfies all three ratios simultaneously.

Your Answer: _____

Q7.

Assertion (A): The graph of every linear equation in two variables is a straight line.

Reason (R): A linear equation in two variables always represents a parabola on the coordinate plane.

Your Answer: _____

Q8.

Assertion (A): The pair of equations $x/2 + y/3 = 3$ and $x + 2y/3 = 6$ represents a pair of coincident lines.

Reason (R): Two equations represent coincident lines only when both equations are identical.

Your Answer: _____

Q9.

Assertion (A): If the sum of two numbers is 20 and their difference is 4, then the larger number is 12.

Reason (R): By solving the system $x + y = 20$ and $x - y = 4$, we get $x = 12$ and $y = 8$ using the elimination method.

Your Answer: _____

Q10.

Assertion (A): The equation $4x + 5y = 20$ has no solution in natural numbers.

Reason (R): Every linear equation in two variables has infinitely many real solutions.

Your Answer: _____

◆ ANSWER KEY ◆

Section A – MCQ Answers

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
(b)	(d)	(a)	(c)	(b)	(a)	(c)	(b)	(d)	(c)	(a)	(b)	(c)	(c)	(d)	(c)	(c)	(c)	(b)	(b)

Section B – Assertion-Reason Answers

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
(a)	(a)	(c)	(d)	(a)	(a)	(c)	(b)	(a)	(d)

★ All the Best! ★