



Code No. **Series AG-1-9999**

TMC-D/79/89/36

General Instructions :

- All questions are compulsory.
- The question paper consists of 34 questions divided into four sections A,B,C and D. Section – A comprises of 10 question of 1 mark each. Section – B comprises of 8 questions of 2 marks each. Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 6 questions of 4 marks each.
- Question numbers 1 to 10 in Sections – A are multiple choice questions where you are to select one correct option out of the given four.
- There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four mark each. You have to attempt only one If the alternatives in all such questions.
- Use of calculator is not permitted.
- An additional 15 minutes time has been allotted to read this question paper only.

सामान्य निर्देश :

- सभी प्रश्न अनिवार्य हैं।
- इस प्रश्न पत्र में 34 प्रश्न हैं, जो चार खण्डों में अ, ब, स व द में विभाजित हैं। खण्ड – अ में 10 प्रश्न हैं और प्रत्येक प्रश्न 1 अंक का है। खण्ड – ब में 8 प्रश्न हैं और प्रत्येक प्रश्न 2 अंको के हैं। खण्ड – स में 10 प्रश्न हैं और प्रत्येक प्रश्न 3 अंको का है। खण्ड – द में 6 प्रश्न हैं और प्रत्येक प्रश्न 4 अंको का है।
- प्रश्न संख्या 1 से 10 बहुविकल्पीय प्रश्न हैं। दिए गए चार विकल्पों में से एक सही विकल्प चुनें।
- इसमें कोई भी सर्वोपरि विकल्प नहीं है, लेकिन आंतरिक विकल्प 1 प्रश्न 2 अंको में, 3 प्रश्न 3 अंको में और 2 प्रश्न 4 अंको में दिए गए हैं। आप दिए गए विकल्पों में से एक विकल्प का चयन करें।
- कैलकुलेटर का प्रयोग वर्जित है।
- इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है। इस अवधि के दौरान छात्र केवल प्रश्न-पत्र को पढ़ेंगे और वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे।

Time : 3 to 3 1/2 Hours

अधिकतम समय : 3 से 3 1/2

Maximum Marks : 80

अधिकतम अंक : 80

Total No. Of Pages : 4

कुल पृष्ठों की संख्या : 4

CLASS – X MATHEMATICS CBSE/STATE BOARD

Section A

Q.1	If : $5x - y = 7$; $x - y = -1$ and $y = m x + 3$ then the value of m . (a) 3 (b) -3 (c) 1 (d) 0 Ans d
Q.2	If the system of equations ; $2x + 3y = 7$; $(a + b)x + (2a - b)y = 21$ has infinitely many solutions, then (a) $a = 1, b = 5$ (b) $a = 5, b = 1$ © $a = -1, b = 5$ (d) $a = 5, b = -1$ Ans b
Q.3	One equation of a pair of dependent linear equations is $-5x + 7y = 2$, the second equation can be : (a) $10x + 14y + 4 = 0$ (b) $-10x - 14y + 4 = 0$ © $-10x + 14y + 4 = 0$ (d) $10x - 14y = -4$ Ans d
Q.4	The pair of equations $y = 0$ and $y = -7$ has : (A) one solution (B) two solutions (C) infinitely many solutions (D) no solution Ans d

<p>Q.5</p>	<p>If $am \neq bl$, then the system of equations $ax + by = c$ $lx + my = n$</p> <p>(a) has a unique solution (b) has no solution (c) has infinitely many solutions (d) may or may not have a solution Ans a</p>
<p>Q.6</p>	<p>If a pair of linear equations is consistent, then the lines will be :</p> <p>(A) parallel (B) always coincident (C) intersecting or coincident (D) always intersecting. Ans c</p>
<p>Q.7</p>	<p>The following pairs of linear equations $2x + 5y = 3$ and $6x + 15y = 12$ represents:</p> <p>(a) Intersecting lines (b) Parallel lines (c) Coincident lines (d) None from a, b, c Ans b</p>
<p>Q.8</p>	<p>The number of solutions of the pair of linear equations $x + 2y - 8 = 0$ and $2x + 4y = 16$ have :</p> <p>(a) 0 (b) 1 (c) Infinitely many (d) None Ans c</p>
<p>Q.9</p>	<p>If $2x - 3y = 7$ and $(a + b)x - (a + b - 3)y = 4a + b$ represent coincident lines, then a and b satisfy the equation</p> <p>(a) $a + 5b = 0$ (b) $5a + b = 0$ (c) $a - 5b = 0$ (d) $5a - b = 0$ Ans c</p>
<p>Q.10</p>	<p>The value of k, if line represented by the equation $2x - ky = 9$ passes through the point $(-1, -1)$.</p> <p>(a) 12 (b) 11 (c) 10 (d) None of these Ans b</p>

Section B

Q.11 In figure 2, ABCD is a parallelogram. Find the values of x and y. **Ans $x + y = 9$; $x - y = 5$ & $x = 7$, $y = 2$**

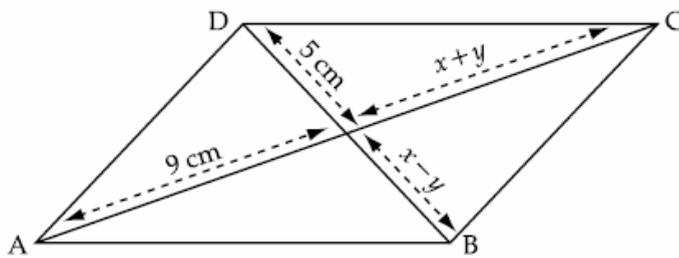


Figure 2

Q.12 Solve for x and y : $4x + \frac{y}{3} = \frac{8}{3}$, $\frac{x}{2} + \frac{3y}{4} = -\frac{5}{2}$. **Ans $x = 1$, $y = -4$**

OR

Solve the following system of equation: $4x + \frac{6}{y} = 15$ & $6x - \frac{8}{y} = 14$.

$$4x + \frac{6}{y} = 15 \text{-----(1)}$$

$$6x - \frac{8}{y} = 14 \text{-----(2)}$$

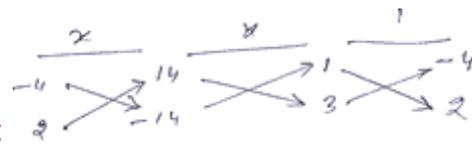
Solution:-

Multiplying equation (1) by 4 and (2) by 3 and then adding we get

$$\begin{array}{r}
 16x + \frac{24}{y} = 60 \\
 18x - \frac{24}{y} = 42 \\
 \hline
 34x = 102 \\
 \text{Or, } x = 3
 \end{array}
 \quad
 \begin{array}{r}
 4 \times 3 + \frac{6}{y} = 15 \\
 \text{Or, } \frac{6}{y} = 3 \\
 \text{Or, } y = 2 \quad \therefore x = 3, y = 2
 \end{array}$$

Q.13

Solve the system of equation by cross Multiplication method : $x - 4y + 14 = 0$, $3x + 2y - 14 = 0$.

ANS : 

$$\frac{x}{(-4) \times (-14) - 2 \times 14} = \frac{y}{14 \times 3 - (-14) \times 1} = \frac{1}{1 \times 2 - 3 \times (-4)} \quad \text{Or, } \frac{x}{56 - 28} = \frac{y}{42 + 14} = \frac{1}{2 + 12}$$

$$\text{Or, } \frac{x}{28} = \frac{y}{56} = \frac{1}{14} \quad \text{Or, } x = 28/14 = 2, \text{ Or, } y = 56/14 = 4 \quad \therefore x = 2, y = 4$$

Q.14

Solve : $99x + 101y = 499xy$; $101x + 99y = 501xy$. **Ans $x = 1/2, y = 1/3$**

Q.15

On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the following pair of linear equations is consistent or inconsistent : $\frac{4}{3}x + 2y = 8$; $2x + 3y = 12$. **Ans Consistent**

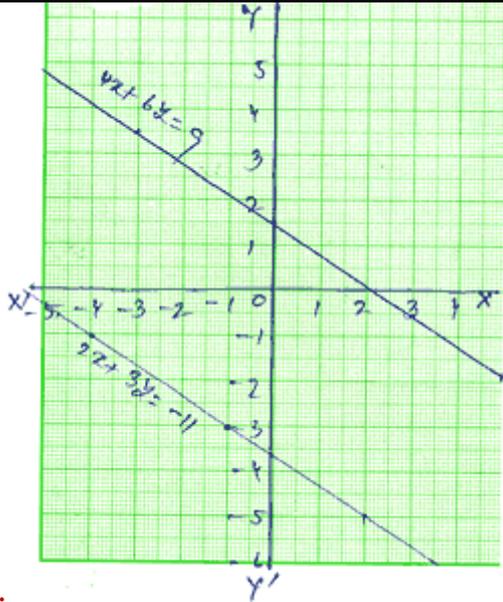
Q.16

If $4a + 3b = 65$ and $a + 2b = 35$. Find the value of $\frac{a}{b}$. **Ans $1/3$ a = 5 b = 15**

Q.17

Solve graphically the system of linear equations: $4x + 6y = 9$ & $2x + 3y = -11$. Also write the nature of graph.

Nature :- Lines are parallel .Equation has no solution and equation is inconsistence



Q.18 Express y in term of x of equation $5x - 3y = 7$ and find the corresponding value of y where $x = -2/3$. **Ans** $y = \frac{5x - 7}{-3}$ & $y = \frac{-31}{9}$

Section C

Q.19 Solve graphically the pair of liner equations. $x - y = -1$ and $2x + y - 10 = 0$. Also find the area of the region bounded by these lines and x -axis. **Ans** $x = 3, y = 4$ vertices : $(-1, 0); (5, 0)$ & $(3, 4)$ area = 12 sq unit

Q.20 Determine the value of c for which the following system of linear equations has no solution: $c x + 3y = 3; 12x + cy = 6$. **Ans. C = 6**

OR

Find the value of a and b for which the following system of linear equations has infinite numbers of solutions: $2x - 3y = 7; (a + b)x - (a + b - 3)y = 4a + b$. **Ans. A = -5; b = -1**

Q.21 The sum of the numerator and denominator of a fraction is 3 less than twice the denominator. If the numerator and denominator are decreased by 1, the numerator becomes half the denominator. Determine the fraction.

Solution:- Let numerator be x and denominator be y

$$\therefore \text{Fraction} = \frac{x}{y}$$

$$x + y = 2y - 3$$

$$\text{or, } x - y + 3 = 0 \text{ \& } 2x - y - 1 = 0 \therefore x = 4 \text{ \& } y = 7$$

∴ Fraction = $x/y = 4/7$

OR

If the numerator of a fraction is multiplied by 2 and its denominator is increased by 2, it becomes $6/7$. If instead we multiply the denominator by 2 and increase the numerator by 2 it reduces to $1/2$. What is the fraction? **Ans. $\frac{3}{5}$**

Q.22

Determine the value of k so that the following linear equations have no solution:

$$(3k + 1)x + 3y - 2 = 0 \text{ \& } (k^2 + 1)x(k - 2)y - 5 = 0$$

Solution:-

$$\frac{a_1}{a_2} = \frac{3k+1}{k^2+1}, \frac{b_1}{b_2} = \frac{3}{k-2}, \frac{c_1}{c_2} = \frac{2}{5} \quad \text{For no solution, } \frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2} \quad \text{OR} \quad \frac{3k+1}{k^2+1} = \frac{3}{k-2} \neq \frac{2}{5}$$

$$\text{Now, } \frac{3k+1}{k^2+1} = \frac{3}{k-2}$$

$$\text{Or, } (k - 2)(3k + 2) = 3(k^2 + 1) \text{ Or, } 3k^2 - 5k - 2 = 3k^2 + 3 \text{ Or, } -5k = 5 \text{ Or, } k = -1$$

Q.23

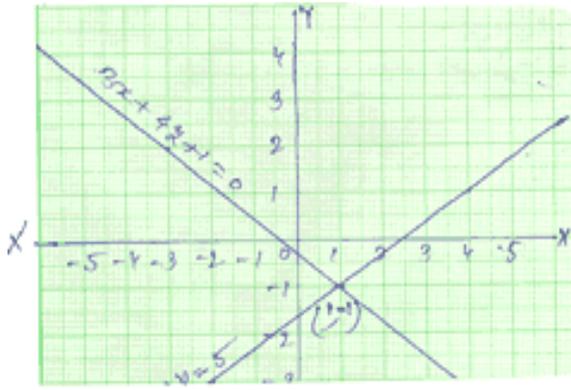
Solve graphically the system of equations: $2x - 3y = 5$; $3x + 4y + 1 = 0$.Also write the nature of graph .

Solution: . $2x - 3y = 5$

x	1	-2	4
y	-1	-3	1

$$3x + 4y + 1 = 0$$

x	1	-3	5
y	-1	2	-4



Again we plot the point (1, -1), (-3, 2) and ((5, -4) on the same graph paper and join them.

Now, we get see that the lines of these two equations intersect at (1, -1).
 $\therefore x = 1$ and $y = -1$. Is the solution of the system of equations.

Nature :- Lines are intersect .Equation has unique solution and equation is consistence .

Q.24 Three chairs and two tables cost Rs 1850. Five chairs and three tables cost Rs 2850. Find the cost of two chairs and two tables.

Solutions:- Let price of one chair be Rs. x and price of one table be Rs. y .

\therefore A/Q $5x + 3y = 2850$ ----- (1)

and $3x + 2y = 1850$ ----- (2) therefore $x = 150$ & $y = 700$

$$2x + 2y = 2 \times 150 + 2 \times 700$$

$$\text{Rs} = 1700$$

\therefore Cost of 2 chairs and 2 tables

Q.25 Yesh scored 40 marks in a test , reciving 3 marks for each right answer and losing one marks for each wrong answer . Had 4 marks been awered for each correct answer and 2 marks been deducted for each in correct answer , then yesh would have scored 50 marks . How many question were there in the test ? **Ans right $\therefore x = 15$ wrong $\therefore y = 5 \Rightarrow total = 20$**

Q.26 Solve for x and y : $7(y + 3) - 2(x + 2) = 14$; $4(y - 2) + 3(x - 3) = 2$. **Ans. $X = 5$ $y = 1$**

Q.27 Solve graphically the following system of linear equations: $2x - y = 2$ and $4x - y = 8$. Also find the co- ordinates of the points where the lines meet the axis of x and y . Hence find a if $4x + 3y = a$. **Ans $x = 3, y = 4, a = 24$ on x axis (1,0) & (2,0) on y axis (0,-2) & (0,-8)**

Q.28 Solve for x and y: $\frac{5}{x-1} + \frac{1}{y-2} = 2$ & $\frac{6}{x-1} - \frac{3}{y-2} = 1$. **Ans x=4,y=5**
 OR
 For what value of K will the system $x + 2y = 3$, $5x + Ky + 7 = 0$ have (i) unique solution (ii) no solution ? Is there is any value of K for which the given system has an infinite number of solutions? **Ans.(i) $k \neq 10$ (ii) $k=10$, $k \neq -14/3$ (iii) no solution**

Section D

Q.29 Form a pair of linear equation in two variables using the following information and solve it graphically. Five year ago, sagar was twice as old as Tiru.Ten years later Sagar’s age will be ten years more than Tiru’s age. Find their present ages. What was the age of Sagar when Tiru was born ? **Ans x = 25 ,y =15**
 OR
 Determine graphically the vertices of the triangle, equations of whose sides are given below: $2y - x = 8, 5y - x = 14, y - 2x = 1$. **Ans A(-4,2); B(1,3); C(2,5)**

Q.30 There are two examination halls, A and B. If 12 candidates are sent from A to B, the number of students in each room is the same. If 11 candidates are sent from room B to room A, then the number of students in A is double the number of students in B. Find the number of candidates in each room. **Ans $x - y = 24, x - 2y = -33, y = 57, x = 81$**

Q.31 Two places A and B are 120 km apart from each other on a highway. A car starts from A B and another from B at the same time. If they move in the same direction, they meet in 6 hours and if they move in opposite directions, they meet in 1 hour and 12 minutes. Find the speeds of the cars.

Solution: - Let the speed of car at A be X km/h and speed of car at B be y km/h

Distance covered by car at A in 6 hours = 6x

and distance covered by car at B in 6 hours = 6y

$\therefore 6x - 6y = 120$

or, $x - y = 20$ -----(1)

1hour 12 minutes = $1\frac{12}{60} = 1\frac{1}{5}$
 $= \frac{6}{5}$ hour

$\therefore \frac{6}{5}x + \frac{6}{5}y = 120$

or, $x + y = 100$ ----- (2)

$\therefore x = 60 \text{ \& } y = 40$

\therefore Speeds of car are 60 km/h & 40 km/h.

OR

Solve for x and y: $\frac{44}{x+y} + \frac{30}{x-y} = 10; \frac{55}{x+y} + \frac{40}{x-y} = 13$

Solution: putting $1/x + y = u$ and $1/x - y = v$ the given equation reduces to

$44u + 30v = 10 ; 55u + 40v = 13$

$u = 1/11$ Or, $x+y = 11$ ------(5)

$v = 1/5$ Or, $x-y = 5$ ------(6) $\therefore x = 8, y = 3$

Q.32 In each of the following systems of equations determine whether the system has a unique solution, no solution or infinitely many solutions. In case there is a unique solution, find it.

(i) $2x+3y=7$ (ii) $6x+5y=11$ (iii) $-3x+4y=5$
 $6x+5y=11$ $9x+\frac{15}{2}y=21$ $\frac{9}{2}x-6y+\frac{15}{2}=0$. **Ans.x = -1/4 y=5/2 (i)**

unique (ii) no sol (iii) many solution

Q.33 Solve for x and y : $\frac{5x + 6y - 7}{2} = \frac{2x + 5y + 3}{3} = \frac{8 - 4x + 3y}{2}$. **Ans.x = 1, y =2**

Q.34 Father’s age is three times the sum of ages of his two children. After 5 years his age will be twice the sum of the ages of two children. Find the age of father. **Ans 45** $3x-4y=40, 4x-2y=50$

Think only of the best ,
work only for the best ,
and expect only the best