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Pair of Linear Equations in Two Variables

Chapter 3 · Previous Year Questions with Answers · Class X Mathematics Basic (241)

01 TOPIC 1 Consistency & Nature of Solutions

QUICK RECAP

- For $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$:
- $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$: intersecting lines, unique solution (consistent).
- $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$: coincident lines, infinitely many solutions (consistent, dependent).
- $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$: parallel lines, no solution (inconsistent).
- $x = a$ is a line parallel to the y-axis; $y = b$ is parallel to the x-axis; they meet at (a, b).

Q1 MCQ · 1 mark — **2023** – 430/C/1, 430/C/2, 430/C/3

The pair of linear equations $5x + 4y = 20$ and $10x + 8y = 16$ has :

(A) no solution
(B) infinite number of solutions
(C) a unique solution
(D) two solutions

ANSWER **(A) no solution**

Q2 MCQ · 1 mark — **2023** – 430/C/B

The value of k for which the pair of equations $kx + 3y = 1$, $4x + 2y = 5$ has no solution, is :

(A) 12
(B) -6
(C) 6
(D) 5

ANSWER **(C) 6**

Q3 MCQ · 1 mark — **2023** – 430/C/B

The pair of equations $3x - 15y = 7$ and $2x - 10y = \frac{14}{3}$ has :

(A) one solution
(B) two solutions
(C) infinitely many solutions
(D) no solution

ANSWER **(C) infinitely many solutions**

Q4 MCQ · 1 mark — **2023** – 430(B)

The pair of linear equations $3x - 5y - 2 = 0$ and $-9x + 15y - 5 = 0$ has :

(A) a unique solution
(B) exactly two solutions
(C) infinitely many solutions
(D) no solution

ANSWER *

$\frac{3}{-9} = \frac{-5}{15} = -\frac{1}{3} \neq \frac{-2}{-5}$: parallel lines, no solution

(D) no solution

Q5 MCQ · 1 mark **2023** – 430/2/1, 430/2/2, 430/2/3

The pair of linear equations $x + 2y - 5 = 0$ and $2x - 4y + 6 = 0$:

(A) is inconsistent
(B) is consistent with many solutions
(C) is consistent with a unique solution
(D) is consistent with two solutions

ANSWER *

$\frac{1}{2} \neq \frac{2}{-4}$: intersecting lines, unique solution

(C) is consistent with a unique solution

Q6 MCQ · 1 mark **2023** – 430/2/1, 430/2/2, 430/2/3

The lines represented by the linear equations $y = x$ and $x = 4$ intersect at P. The coordinates of the point P are :

(A) $(4,\ 0)$
(B) $(4,\ 4)$
(C) $(0,\ 4)$
(D) $(-4,\ 4)$

ANSWER *

Putting $x = 4$ in $y = x$: $y = 4$

(B) $(4,\ 4)$

Q7 MCQ · 1 mark **2023** – 430/4/1, 430/4/2

The pair of linear equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ has :

(A) a unique solution
(B) exactly two solutions
(C) infinitely many solutions
(D) no solution

ANSWER *

$\frac{1}{-3} = \frac{2}{-6} = -\frac{1}{3} \neq \frac{5}{1}$: parallel lines

(D) no solution

Q8 MCQ · 1 mark **2023** – 430/4/1, 430/4/2, 430/4/3

If the pair of linear equations $x - y = 1$, $x + ky = 5$ has a unique solution $x = 2,\ y = 1$, then the value of k is :

(A) -2
(B) -3
(C) 3
(D) 4

ANSWER *

$2 + k(1) = 5 \Rightarrow k = 3$

(C) 3

Q9 MCQ · 1 mark **2023** – 430/4/3

The value of k for which the equations $3x - y + 8 = 0$ and $6x - ky + 16 = 0$ represent coincident lines is :

(A) $\frac{1}{2}$ (B) $-\frac{1}{2}$
(C) 2 (D) -2

ANSWER *
$\frac{3}{6} = \frac{-1}{-k} = \frac{8}{16} \Rightarrow \frac{1}{k} = \frac{1}{2} \Rightarrow k = 2$
(C) 2

Q10 MCQ · 1 mark **2023** – 430/5/1, 430/5/2, 430/5/3

If the lines represented by equations $3x + 2my = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of m is :

(A) $\frac{2}{5}$ (B) $-\frac{5}{4}$
(C) $\frac{3}{2}$ (D) $\frac{15}{4}$

ANSWER *
Parallel: $\frac{3}{2} = \frac{2m}{5} \Rightarrow m = \frac{15}{4}$ (and $\frac{-2}{1} \neq$ these ratios)
(D) $\frac{15}{4}$

Q11 MCQ · 1 mark **2023** – 430/6/1, 430/6/3

The value of k, if $(6,\ k)$ lies on the line represented by $x - 3y + 6 = 0$, is

(A) -4 (B) 12
(C) -12 (D) 4

ANSWER *
$6 - 3k + 6 = 0 \Rightarrow k = 4$
(D) 4

Q12 MCQ · 1 mark **2023** – 430/6/2

The value of 'p' if $(-2,\ p)$ lies on the line represented by the equation $2x - 3y + 7 = 0$, is

(A) $-\frac{13}{2}$ (B) $\frac{13}{2}$
(C) -1 (D) 1

ANSWER *
$-4 - 3p + 7 = 0 \Rightarrow p = 1$
(D) 1

Q13 MCQ · 1 mark **2023** – 430/6/1, 430/6/2, 430/6/3

The value of 'k' for which the system of equations $kx + 2y = 5$ and $3x + 4y = 1$ have no solution, is

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(A) $k = \frac{3}{2}$
(B) $k \neq \frac{3}{2}$
(C) $k \neq \frac{2}{3}$
(D) $k = 15$

ANSWER *

$\frac{k}{3} = \frac{2}{4} \neq \frac{5}{1} \Rightarrow k = \frac{3}{2}$

(A) $k = \frac{3}{2}$

Q14 MCQ · 1 mark **2024** – 430/S/1

A system of linear equations is given by : $a_1x + b_1y = c_1$, $a_2x + b_2y = c_2$, where $\frac{a_1}{a_2} = \frac{b_1}{b_2}$ $(a_1, a_2, b_1, b_2 \neq 0)$. Which of the following statements is true ?

(A) The given system has a unique solution.
(B) The given system has no solution.
(C) The given system has infinite number of solutions.
(D) The given system has no solution or has infinite number of solutions.

ANSWER **(D) The given system has no solution or has infinite number of solutions.**

Q15 MCQ · 1 mark **2024** – 430/S/2

The system of equations given by : $2x - 3y = 5$, $6x + 9y = 15$

(A) has a unique solution
(B) has no solution
(C) has infinitely many solutions
(D) may have infinitely many solutions or no solution

ANSWER **(A) has a unique solution**

Q16 MCQ · 1 mark **2024** – 430/S/3

If the system of equations $2x + 3y = 5$ and $4x + ky = 10$ has infinitely many solutions, then the value of 'k' is :

(A) 1
(B) $\frac{1}{2}$
(C) $\frac{3}{2}$
(D) 6

ANSWER **(D) 6**

Q17 MCQ · 1 mark **2024** – 430(B)/S

The pair of equations $x = 3$ and $y = -2$ graphically represent lines which are :

(A) coincident
(B) parallel
(C) intersecting at $(3, -2)$
(D) intersecting at $(-3, 2)$

ANSWER **(C) intersecting at $(3, -2)$**

Q18 MCQ · 1 mark **2024** – 430(B)

The value of 'k' for which the lines represented by the equations $3x + 5y = 2$ and $9x + 15y = 2k$ coincide, is :

(A) 3
(B) -3
(C) 6
(D) -6

ANSWER *

$\frac{3}{9} = \frac{5}{15} = \frac{2}{2k} \Rightarrow k = 3$

(A) 3

Q19 MCQ · 1 mark **2024** – 430/1/1, 430/1/2, 430/1/3

The value of k for which the pair of linear equations $5x + 2y - 7 = 0$ and $2x + ky + 1 = 0$ don't have a solution, is :

(A) 5
(B) $\frac{4}{5}$
(C) $\frac{5}{4}$
(D) $\frac{5}{2}$

ANSWER *

$\frac{5}{2} = \frac{2}{k} \neq \frac{-7}{1} \Rightarrow k = \frac{4}{5}$

(B) $\frac{4}{5}$

Q20 MCQ · 1 mark **2024** – 430/2/2, 430/2/3

The graph of a pair of linear equations $a_1x + b_1y = c_1$ and $a_2x + b_2y = c_2$ in two variables x and y represents parallel lines, if

(A) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
(B) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$
(C) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} = \frac{c_1}{c_2}$
(D) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

ANSWER *

Parallel lines: coefficients of x and y proportional, constants not.

(D) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Q21 MCQ · 1 mark **2024** – 430/2/2

The value of 'k' for which the pair of linear equations $x + y - 4 = 0$ and $2x + ky - 8 = 0$ has infinitely many solutions, is

(A) $k \neq 2$
(B) $k \neq -2$
(C) $k = 2$
(D) $k = -2$

ANSWER *

$\frac{1}{2} = \frac{1}{k} = \frac{-4}{-8} \Rightarrow k = 2$

(C) $k = 2$

Q22 MCQ · 1 mark **2024** – 430/2/3

The value of 'p' for which the pair of equations $-2x + 3y - 9 = 0$ and $4x + py + 7 = 0$ has a unique solution is

(A) $p \neq 6$
(B) $p = 6$
(C) $p = -6$
(D) $p \neq -6$

ANSWER *

Unique: $\frac{-2}{4} \neq \frac{3}{p} \Rightarrow p \neq -6$

(D) $p \neq -6$

Q23 MCQ · 1 mark **2024** – 430/3/2, 430/3/3

The lines represented by linear equations $x = a$ and $y = b$ $(a \neq b)$ are

(A) intersecting at $(a,\ b)$.
(B) intersecting at $(b,\ a)$.
(C) parallel.
(D) coincident.

ANSWER *

$x = a$ is parallel to the y-axis and $y = b$ to the x-axis; they meet at $(a,\ b)$.

(A) intersecting at $(a,\ b)$.

Q24 MCQ · 1 mark **2024** – 430/5/1, 430/5/2, 430/5/3

The pair of linear equations $2kx + 5y = 7$, $6x + 5y = 11$ have a unique solution, if

(A) $k \neq 3$
(B) $k \neq -3$
(C) $k \neq \frac{1}{3}$
(D) $k \neq -\frac{1}{3}$

ANSWER *

$\frac{2k}{6} \neq \frac{5}{5} \Rightarrow k \neq 3$

(A) $k \neq 3$

Q25 MCQ · 1 mark **2025** – 430(B)

For what value of p, pair of equations $2x + 3y = 4$, $(p + 2)x + 6y = (3p + 2)$ will have infinitely many solutions ?

(A) 1
(B) 4
(C) 5
(D) 2

ANSWER *

$\frac{2}{p+2} = \frac{3}{6} = \frac{4}{3p+2} \Rightarrow p = 2$ (both ratios equal $\frac{1}{2}$)

(D) 2

Q26 MCQ · 1 mark **2025** – 430(B)

The pair of equations $7x - 14y = -7$ and $3x - 6y = 21$ has

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(A) unique solution.
(B) two solutions.
(C) no solution.
(D) infinitely many solutions.

ANSWER *
$\frac{7}{3} = \frac{-14}{-6} \neq \frac{-7}{21}$: parallel lines
(C) no solution.

Q27 MCQ · 1 mark **2025** – 430/2/1

If $(0,\ 0)$ is the solution of the equation $x + y = c - 1$, then the value of c is :

(A) 0
(B) 1
(C) -1
(D) any real number

ANSWER *
$0 = c - 1 \Rightarrow c = 1$
(B) 1

Q28 MCQ · 1 mark **2025** – 430/2/2, 430/2/3

The number of solutions of the system of equations $x = 3, y = -1$ is :

(A) 0
(B) 1
(C) 2
(D) Infinite

ANSWER *
The lines meet only at $(3,\ -1)$.
(B) 1

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Q29 MCQ · 1 mark **2025** – 430/3/1

For what value(s) of k does the system of equations $kx + 2y = 3$ and $2x + y = 5$ have a unique solution ?

(A) k = a real number
(B) $k \neq 8$
(C) $k \neq 4$
(D) $k = 4$

ANSWER *
$\frac{k}{2} \neq \frac{2}{1} \Rightarrow k \neq 4$
(C) $k \neq 4$

Q30 MCQ · 1 mark **2025** – 430/3/2

For what value(s) of k, is the system of equations $kx + 2y = 3$ and $2x + y = 5$ inconsistent ?

(A) k = Any real number
(B) $k \neq 2$
(C) $k \neq 4$
(D) $k = 4$

ANSWER *
$\frac{k}{2} = \frac{2}{1} \neq \frac{3}{5} \Rightarrow k = 4$
(D) $k = 4$

Q31 MCQ · 1 mark **2025** – 430/3/3

The system of linear equations given by $x = a$ and $y = b$ is :

(A) Consistent with a unique solution.
(B) Consistent with infinitely many solutions.
(C) Consistent with two solutions.
(D) Inconsistent.

ANSWER *

The lines meet only at $(a,\ b)$.

(A) Consistent with a unique solution.

Q32 MCQ · 1 mark **2025** – 430/4/1, 430/4/2, 430/4/3

The value of m for which lines $14x + my = 20$ and $-3x + 2y = 16$ are parallel, is :

(A) $-\frac{3}{14}$
(B) $-\frac{7}{3}$
(C) $-\frac{28}{3}$
(D) $-\frac{3}{28}$

ANSWER *

$\frac{14}{-3} = \frac{m}{2} \Rightarrow m = -\frac{28}{3}$

(C) $-\frac{28}{3}$

Q33 MCQ · 1 mark **2025** – 430/6/1, 430/6/2

The line $2x - 3y = 6$ intersects x-axis at

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

ANSWER *

On the x-axis $y = 0$: $2x = 6 \Rightarrow x = 3$

(D) $(3,\ 0)$

Q34 MCQ · 1 mark **2025** – 430/6/1, 430/6/2, 430/6/3

The value of k for which the system of equations $3x - 7y = 1$ and $kx + 14y = 6$ is inconsistent, is

(A) -6
(B) $\frac{2}{3}$
(C) 6
(D) $\frac{-3}{2}$

ANSWER *

$\frac{3}{k} = \frac{-7}{14} \Rightarrow k = -6; \frac{1}{6} \neq -\frac{1}{2}$

(A) -6

Q35 MCQ · 1 mark **2025** – 430/6/3

The point $(3,\ -5)$ lies on the line $mx - y = 11$. The value of m is

(A) 3
(B) -2

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(C) 8
(D) 2

ANSWER *

$3m + 5 = 11 \Rightarrow m = 2$

(D) 2

Q36 MCQ · 1 mark **2026 (I)** – 430(B)

The value of k for which the pair of linear equations $kx - 3y = 5$, $4x - 6y = 10$ has infinitely many solutions, is :

(A) 4
(B) 3
(C) 2
(D) 1

ANSWER *

$\frac{k}{4} = \frac{-3}{-6} = \frac{5}{10} \Rightarrow k = 2$

(C) 2

Q37 MCQ · 1 mark **2026 (II)** – 430/7/1, 430/7/2, 430/7/3

The system of linear equations $4x - 12y = k$ and $x = 3y + 4$ is found inconsistent. Which of the following is true for the value of k ?

(A) $k = 16$
(B) k can be any real number
(C) $k \neq 16$
(D) $k \neq 0$

ANSWER **(C) $k \neq 16$**

Q38 MCQ · 1 mark **2026 (II)** – 430/8/1, 430/8/2, 430/8/3

The pair of equations $x = 2$ and $y = 3$ represent the lines which are

(A) intersecting at $(-2, -3)$
(B) intersecting at $(2, 3)$
(C) parallel
(D) coincident

ANSWER **(B) intersecting at $(2, 3)$**

Q39 MCQ · 1 mark **2026 (II)** – 430(B)

The value of p for which the pair of linear equations $3x - 2y + 5 = 0$ and $px + 4y - 10 = 0$ will have infinitely many solutions, is :

(A) 6
(B) -6
(C) 9
(D) -9

ANSWER **(B) -6**

Q40 Assertion–Reason · 1 mark **2023** – 430/1/1, 430/1/2, 430/1/3

Assertion (A) : The system of linear equations $3x + 5y - 4 = 0$ and $15x + 25y - 25 = 0$ is inconsistent.
Reason (R) : The pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ is inconsistent if $\frac{a_1}{a_2} =$

$\frac{b_1}{b_2} \neq \frac{c_1}{c_2}$.

(A) Both true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

ANSWER *

$\frac{3}{15} = \frac{5}{25} = \frac{1}{5} \neq \frac{-4}{-25}$: inconsistent. R is the condition used.

(A) Both A and R are true and R is the correct explanation of A.

Q41 Assertion–Reason · 1 mark — **2024** – 430/4/1, 430/4/2, 430/4/3

Assertion (A) : The pair of linear equations $5x + 2y + 6 = 0$ and $7x + 6y + 18 = 0$ have infinitely many solutions.

Reason (R) : The pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ have infinitely many solutions, if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$.

(A) Both true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

ANSWER *

$\frac{5}{7} \neq \frac{2}{6}$: unique solution, so A is false; R is the correct condition, so R is true.

(D) Assertion (A) is false, but Reason (R) is true.

Q42 Assertion–Reason · 1 mark — **2026 (II)** – 430/7/1, 430/7/2, 430/7/3

Assertion (A) : The pair of linear equations $y = x$ and $y = 2x$ has infinitely many solutions.

Reason (R) : A pair of linear equations represented by coincident lines has infinitely many solutions.

(A) Both true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

ANSWER **(D) Assertion (A) is false, but Reason (R) is true.**

Q43 Very Short Answer · 2 marks · Internal choice (OR) part — **2023** – 430/1/1, 430/1/2, 430/1/3

Find out whether the following pair of linear equations are consistent or inconsistent : $5x - 3y = 11$, $-10x + 6y = 22$

ANSWER *

$\frac{a_1}{a_2} = \frac{5}{-10} = -\frac{1}{2}, \frac{b_1}{b_2} = \frac{-3}{6} = -\frac{1}{2}, \frac{c_1}{c_2} = \frac{-11}{-22} = \frac{1}{2}$

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$: parallel lines, so the pair is inconsistent.

Inconsistent

Q44 Very Short Answer · 2 marks · Internal choice (OR) part — **2024** – 430/1/1, 430/1/2, 430/1/3

Check whether the point $(-4,\ 3)$ lies on both the lines represented by the linear equations $x + y + 1 = 0$

and $x - y = 1$.

ANSWER *

$x + y + 1 = -4 + 3 + 1 = 0$: lies on the first line

$x - y = -4 - 3 = -7 \neq 1$: does not lie on the second line

No; it lies only on $x + y + 1 = 0$

Q45 Very Short Answer · 2 marks | Internal choice (OR) part | **2025** – 430/2/1, 430/2/2, 430/2/3

Find the value of c for which the following pair of linear equations has infinitely many solutions : $cx + 3y = c - 3$, $12x + cy = c$

ANSWER *

$\frac{c}{12} = \frac{3}{c} = \frac{c-3}{c}$

$c^2 = 36$ and $c - 3 = 3 \Rightarrow c = 6$

$c = 6$

Q46 Short Answer · 3 marks | Internal choice (OR) part | **2023** – 430/4/2

For which value of 'k' will the following pair of linear equations have no solution ? $3x + y = 1$, $(2k - 1)x + (k - 1)y = 2k + 1$

ANSWER *

No solution: $\frac{3}{2k-1} = \frac{1}{k-1} \neq \frac{1}{2k+1}$

$3(k - 1) = 2k - 1 \Rightarrow k = 2$

Check: $\frac{1}{k-1} = 1 \neq \frac{1}{5} = \frac{1}{2k+1}$; so $k = 2$

$k = 2$

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Q47 Short Answer · 3 marks | Internal choice (OR) part | **2023** – 430/4/1, 430/4/3

Find the values of 'a' and 'b' for which the system of linear equations $3x + 4y = 12$, $(a + b)x + 2(a - b)y = 24$ has infinite number of solutions.

ANSWER *

$\frac{3}{a+b} = \frac{4}{2(a-b)} = \frac{12}{24} = \frac{1}{2}$

$a + b = 6$ and $a - b = 4$

$a = 5,\ b = 1$

$a = 5,\ b = 1$

Q48 Short Answer · 3 marks | **2025** – 430(B)

Find the value of p for which the following system of linear equations has infinitely many solutions : $x +$

$(p+1)y = 5;\ (p+1)x + 9y = 8p - 1$

ANSWER *

$\frac{1}{p+1} = \frac{p+1}{9} = \frac{5}{8p-1}$

$(p+1)^2 = 9 \Rightarrow p = 2$ or $p = -4$

$p = 2$: $\frac{1}{3} = \frac{5}{15}$ holds; $p = -4$: $-\frac{1}{3} \neq \frac{5}{-33}$. Hence $p = 2$

$p = 2$

Q49 Short Answer · 3 marks | Internal choice (OR) part | **2025** – 430/3/1, 430/3/2, 430/3/3

Find the value of k for which the following pair of linear equations will have infinitely many solutions : $kx + 3y - (k-3) = 0$ and $12x + ky - k = 0$. Hence, find any two solutions of the given pair of equations.

ANSWER *

$\frac{k}{12} = \frac{3}{k} = \frac{k-3}{k} \Rightarrow k^2 = 36$ and $k - 3 = 3 \Rightarrow k = 6$

Equations become $6x + 3y - 3 = 0$, i.e. $2x + y = 1$ (both)

Two solutions: $(0,\ 1)$ and $(1,\ -1)$

$k = 6$; **e.g.** $(0,\ 1)$ **and** $(1,\ -1)$

02 TOPIC 2 Graphical Method of Solution

QUICK RECAP

- Find two or three points on each line (put $x = 0$, $y = 0$), plot and join. The point of intersection gives the solution.
- For the area of the triangle formed with an axis, read the vertices from the graph and use $\frac{1}{2} \times$ base $\times$ height.

Q50 MCQ · 1 mark | **2024** – 430(B)/S

The x-coordinate of the point which lies on the line represented by $3x - y - 1 = 0$ and whose y-coordinate is 5, is :

(A) -2 (B) 2
(C) 5 (D) -5

ANSWER **(B) 2**

Q51 Very Short Answer · 2 marks | **2025** – 430/3/1, 430/3/3

Solve the following system of equations graphically : $2x - 3y = -6$ and $x = 3$

ANSWER *

$2x - 3y = -6$: points $(-3, 0),\ (0, 2),\ (3, 4)$; $x = 3$ is parallel to the y-axis

The lines intersect at $(3, 4)$: $x = 3,\ y = 4$

$x = 3,\ y = 4$

Q52 Very Short Answer · 2 marks **2025** – 430/3/2

Solve the following system of equations graphically : $x + 2y = 10$ and $y = 3$

ANSWER *

$x + 2y = 10$: points $(10, 0),\ (0, 5),\ (4, 3)$; $y = 3$ is parallel to the x-axis

The lines intersect at $(4, 3)$: $x = 4,\ y = 3$

$x = 4,\ y = 3$

Q53 Very Short Answer · 2 marks **2026 (II)** – 430/7/3

Draw the graph of the pair of linear equations $x = -6$ and $x + y = 2$. Hence, find the solution of these equations.

ANSWER

Graph of equations : $x = -6$ and $x + y = 2$ 1½

Solution $x = -6,\ y = 8$ ½

$x = -6,\ y = 8$

Q54 Short Answer · 3 marks **2024** – 430/S/1, 430/S/2, 430/S/3

Solve the following system of linear equations graphically : $x + 2y = 6$ and $3x - 2y = 2$. Also, write the coordinates of the vertices of the triangle formed by these lines and y-axis.

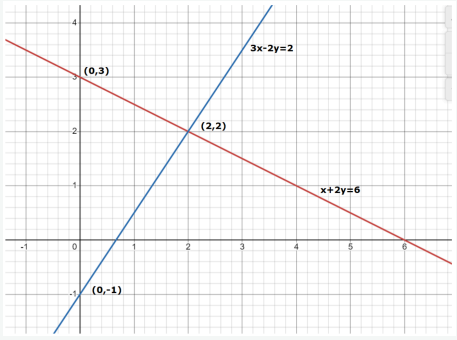
ANSWER

Drawing the graph of $x + 2y = 6$ 1

Drawing the graph of $3x - 2y = 2$ 1

Solution $x = 2$ and $y = 2$ ½

Vertices of the required $\triangle$ are $(0, 3),\ (0, -1)$ and $(2, 2)$ ½



$x = 2,\ y = 2$; **vertices** $(0, 3),\ (0, -1),\ (2, 2)$

Q55 Short Answer · 3 marks · Internal choice (OR) part — **2025** – 430/1/1, 430/1/2, 430/1/3

Solve the following system of equations graphically : $x + 3y = 6; 2x - 3y = 12$

ANSWER *

$x + 3y = 6$: points $(6, 0),\ (0, 2),\ (3, 1)$

$2x - 3y = 12$: points $(6, 0),\ (0, -4),\ (3, -2)$

The lines intersect at $(6, 0)$: $x = 6,\ y = 0$

$x = 6,\ y = 0$

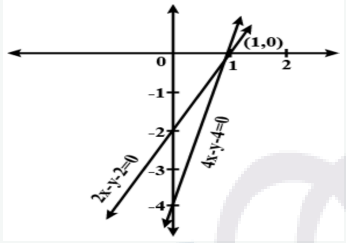
Q56 Long Answer · 5 marks — **2023** – 430/C/1

Solve the pair of linear equations, $2x - y = 2$ and $4x - y = 4$, graphically.

ANSWER

Plotting the graph of each line. 2+2

The solution is $x = 1$ and $y = 0$ 1



$x = 1,\ y = 0$

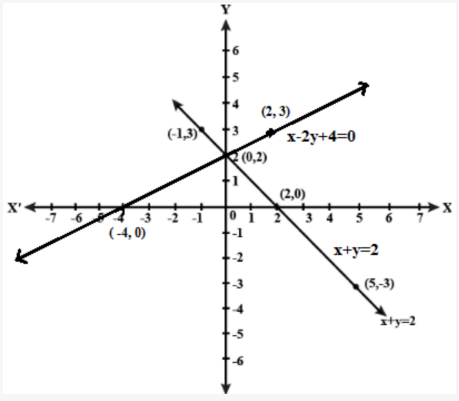
Q57 Long Answer · 5 marks — **2023** – 430/C/2

Solve the pair of linear equations $x - 2y + 4 = 0$ and $x + y = 2$ graphically.

ANSWER

Plotting the graph of each line. 2+2

Solution is $x = 0$ and $y = 2$ 1



$x = 0,\ y = 2$

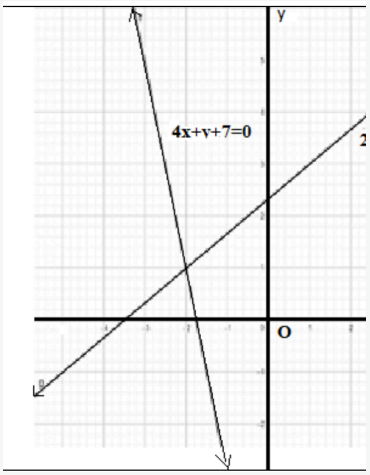
Q58 Long Answer · 5 marks **2023** – 430/C/3

Solve the pair of linear equations $4x + y + 7 = 0$ and $2x - 3y + 7 = 0$ graphically.

ANSWER

Plotting the graph of each line 2+2

Solution: $x = -2$ and $y = 1$ 1



$x = -2,\ y = 1$

Q59 Long Answer · 5 marks Internal choice (OR) part **2024** – 430/3/1, 430/3/2, 430/3/3

Using graphical method, solve the following pair of equations : $x + 2y = 8$ and $3x - 2y = 12$

ANSWER *

$x + 2y = 8$: points $(8, 0),\ (0, 4),\ (2, 3)$

$3x - 2y = 12$: points $(4, 0),\ (0, -6),\ (2, -3)$

The lines intersect at $\left(5,\ \frac{3}{2}\right)$: $x = 5,\ y = \frac{3}{2}$

$x = 5,\ y = \frac{3}{2}$

Q60 Long Answer · 5 marks **2025** – 430/5/1

Determine graphically whether the following pair of linear equations $2x + 3y = 12$ and $x - y = 1$ has unique solution or infinitely many solutions.

ANSWER *

$2x + 3y = 12$: points $(6, 0),\ (0, 4),\ (3, 2)$

$x - y = 1$: points $(1, 0),\ (0, -1),\ (3, 2)$

The lines intersect at one point $(3, 2)$

So the pair has a unique solution $x = 3,\ y = 2$

Unique solution: $x = 3,\ y = 2$

Q61 Long Answer · 5 marks — **2025** – 430/5/3

Solve the following pair of equations using graphical method : $3x - 4y + 3 = 0$ and $-2x + 5y = 9$

ANSWER *

$3x - 4y + 3 = 0$: points $(-1, 0),\ (3, 3),\ (7, 6)$

$-2x + 5y = 9$: points $(-2, 1),\ (3, 3),\ (8, 5)$

The lines intersect at $(3, 3)$: $x = 3,\ y = 3$

$x = 3,\ y = 3$

Q62 Long Answer · 5 marks · Internal choice (OR) part — **2025** – 430/6/1, 430/6/2, 430/6/3

Solve the following pair of linear equations by graphical method : $2x + y = 9$ and $x - 2y = 2$

ANSWER *

$2x + y = 9$: points $(0, 9),\ (3, 3),\ (4, 1)$

$x - 2y = 2$: points $(2, 0),\ (0, -1),\ (4, 1)$

The lines intersect at $(4, 1)$: $x = 4,\ y = 1$

$x = 4,\ y = 1$

Q63 Long Answer · 5 marks · Internal choice (OR) part — **2026 (I)** – 430/4/1, 430/4/2, 430/4/3

Solve the following equations graphically : $x + y = 7$ and $2x - 5y = 7$

ANSWER *

$x + y = 7$: points $(7, 0),\ (0, 7),\ (6, 1)$

$2x - 5y = 7$: points $(1, -1),\ (6, 1),\ (-4, -3)$

The lines intersect at $(6, 1)$: $x = 6,\ y = 1$

$x = 6,\ y = 1$

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03 TOPIC 3 Algebraic Methods of Solution

QUICK RECAP

- Substitution: express one variable from one equation and substitute in the other. Elimination: make coefficients of one variable equal and add/subtract.
- When coefficients are interchanged, e.g. $ax + by = c,\ bx + ay = d$, add and subtract the equations to get $x + y$ and $x - y$ directly.

Q64 Very Short Answer · 2 marks · Internal choice (OR) part — **2023** – 430/1/1, 430/1/2, 430/1/3

Solve for x and y : $x + y = 6, 2x - 3y = 4$.

ANSWER *

From $x + y = 6$: $x = 6 - y$

$2(6 - y) - 3y = 4 \Rightarrow 12 - 5y = 4 \Rightarrow y = \frac{8}{5}$

$x = 6 - \frac{8}{5} = \frac{22}{5}$

$\boxed{x = \frac{22}{5},\ y = \frac{8}{5}}$

Q65 Very Short Answer · 2 marks — **2024** – 430/S/1

Solve : $x + 2y = 6, 2x + y = 6$ and hence find the value of p for which $y = px + 2$.

ANSWER

Solving and getting $x = 2$ and $y = 2$ — 1

Putting x and y in equation $y = px + 2 \Rightarrow p = 0$ — 1

$\boxed{x = 2,\ y = 2; p = 0}$

Q66 Very Short Answer · 2 marks — **2024** – 430/S/2

Solve for x and y : $23x + 24y = 23, 24x + 23y = 24$

ANSWER

Solving both the equations to get $x = 1$ and $y = 0$ — 1+1

$\boxed{x = 1,\ y = 0}$

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Q67 Very Short Answer · 2 marks — **2024** – 430/S/3

Solve for x and y : $x + \frac{y}{2} = 4$ and $\frac{x}{3} + 2y = 5$

ANSWER

On solving the given equations, we get $x = 3$ and $y = 2$ — 1+1

$\boxed{x = 3,\ y = 2}$

Q68 Very Short Answer · 2 marks — **2024** – 430(B)/S

Solve the following pair of linear equations : $2x + 3y = 12; x - 2y = -1$

ANSWER

$2x + 3y = 12$ ...(i); $x - 2y = -1$ ...(ii). Solving the given equations and getting $x = 3$ and $y = 2$ — 1+1

$\boxed{x = 3,\ y = 2}$

Q69 Very Short Answer · 2 marks — **2024** – 430(B)

Solve the following pair of linear equations : $2x - 3y - 17 = 0$ and $4x + y - 13 = 0$

ANSWER *

From the second: $y = 13 - 4x$

$2x - 3(13 - 4x) = 17 \Rightarrow 14x = 56 \Rightarrow x = 4, y = -3$

$x = 4,\ y = -3$

Q70 Very Short Answer · 2 marks | Internal choice (OR) part — **2024** – 430/1/1, 430/1/2, 430/1/3

Solve the following pair of linear equations for x and y algebraically : $x + 2y = 9$ and $y - 2x = 2$

ANSWER *

From the second: $y = 2 + 2x$

$x + 2(2 + 2x) = 9 \Rightarrow 5x = 5 \Rightarrow x = 1, y = 4$

$x = 1,\ y = 4$

Q71 Very Short Answer · 2 marks | Internal choice (OR) part — **2024** – 430/2/1, 430/2/2, 430/2/3

Solve for x and y : $x - 3y = 7, 3x - 3y = 5$

ANSWER *

Subtracting: $2x = -2 \Rightarrow x = -1$

$-1 - 3y = 7 \Rightarrow y = -\frac{8}{3}$

$x = -1,\ y = -\frac{8}{3}$

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Q72 Very Short Answer · 2 marks — **2025** – 430(B)

Solve the following system of linear equations for x and y : $3x + 2y = 11, 2x + 3y = 4$

ANSWER *

Adding: $5x + 5y = 15 \Rightarrow x + y = 3$; subtracting: $x - y = 7$

$x = 5,\ y = -2$

$x = 5,\ y = -2$

Q73 Very Short Answer · 2 marks — **2025** – 430/1/1

Solve the following system of equations for x and y : $\frac{x}{2} + \frac{2y}{3} = -1$ and $x - \frac{y}{3} = 3$

ANSWER *

$3x + 4y = -6$ and $3x - y = 9$

Subtracting: $5y = -15 \Rightarrow y = -3; x = 2$

$x = 2,\ y = -3$

Q74 Very Short Answer · 2 marks — **2025** – 430/1/2

Solve for x and y : $0{\cdot}1x + 0{\cdot}3y = 1,\ 0{\cdot}2x - 0{\cdot}1y = -0{\cdot}1$

ANSWER *

Multiplying by 10: $x + 3y = 10,\ 2x - y = -1$

$y = 2x + 1 \Rightarrow x + 6x + 3 = 10 \Rightarrow x = 1,\ y = 3$

$\boxed{x = 1,\ y = 3}$

Q75 Very Short Answer · 2 marks — **2025** – 430/1/3

Solve for x and y : $3x + 5y = 8,\ 5x - 3y = 2$

ANSWER *

$9x + 15y = 24,\ 25x - 15y = 10$; adding: $34x = 34 \Rightarrow x = 1$

$3 + 5y = 8 \Rightarrow y = 1$

$\boxed{x = 1,\ y = 1}$

Q76 Very Short Answer · 2 marks | Internal choice (OR) part — **2025** – 430/2/1, 430/2/2, 430/2/3

Solve for x and y : $3x + 2y = 65,\ 2x + 3y = 60$

ANSWER *

Adding: $x + y = 25$; subtracting: $x - y = 5$

$x = 15,\ y = 10$

$\boxed{x = 15,\ y = 10}$

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Q77 Very Short Answer · 2 marks — **2026 (II)** – 430/7/1

Solve the following pair of linear equations algebraically : $\frac{3x}{2} - \frac{5y}{3} = -2,\ -\frac{x}{3} + y = 1$

ANSWER

$\frac{3x}{2} - \frac{5y}{3} = -2 \Rightarrow 9x - 10y = -12$ ...(i) ½

$-\frac{x}{3} + y = 1 \Rightarrow -x + 3y = 3$ ...(ii) ½

Solving (i) and (ii) algebraically and getting $x = -\frac{6}{17}$ and $y = \frac{15}{17}$ ½+½

$\boxed{x = -\frac{6}{17},\ y = \frac{15}{17}}$

Q78 Very Short Answer · 2 marks — **2026 (II)** – 430/7/2

Solve the following pair of linear equations algebraically : $\frac{x}{2}+\frac{2y}{3}=-1$ and $x-\frac{y}{3}=5$

ANSWER

$\frac{x}{2}+\frac{2y}{3}=-1 \Rightarrow 3x+4y=-6$ — ½

$x-\frac{y}{3}=5 \Rightarrow 3x-y=15$ — ½

Getting $x=\frac{18}{5}$ and $y=\frac{-21}{5}$ — 1

$\boxed{x=\frac{18}{5},\ y=-\frac{21}{5}}$

Q79 Short Answer · 3 marks — **2023** – 430/C/B

Solve the following pair of equations : $x-y+1=0;\ 3x+2y-12=0$

ANSWER

Eliminating y and getting $x=2$ — 1½

Putting the value of x in any one equation and getting $y=3$ — 1½

$\boxed{x=2,\ y=3}$

Q80 Short Answer · 3 marks · Internal choice (OR) part — **2023** – 430(B)

Solve the following pair of linear equations : $8x+5y=9;\ 3x+2y=4$

ANSWER *

Multiply first by 2 and second by 5: $16x+10y=18,\ 15x+10y=20$

Subtracting: $x=-2$

$8(-2)+5y=9 \Rightarrow y=5$

$\boxed{x=-2,\ y=5}$

Q81 Short Answer · 3 marks · Internal choice (OR) part — **2026 (I)** – 430(B)

Solve the following pair of linear equations : $31x+43y-117=0;\ 43x+31y=105$

ANSWER *

$31x+43y=117,\ 43x+31y=105$

Adding: $74(x+y)=222 \Rightarrow x+y=3$; subtracting: $12(y-x)=12 \Rightarrow y-x=1$

$x=1,\ y=2$

$\boxed{x=1,\ y=2}$

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Q82 Short Answer · 3 marks — **2026 (II)** – 430(B)

Solve the following pair of linear equations : $7(y+3)-2(x+2)=14, 4(y-2)+3(x-3)=2$

ANSWER

$7y-2x=-3; 4y+3x=19$ ½+½

On solving, we get $x=5$ and $y=1$ 1+1

$x=5,\ y=1$

04 TOPIC 4 Word Problems on Linear Equations

QUICK RECAP

- Two-digit number with ten's digit x and unit's digit y is $10x+y$; on reversing digits it becomes $10y+x$.
- Boat/stream: upstream speed $=(u-v)$, downstream speed $=(u+v)$. Time $=\dfrac{\text{distance}}{\text{speed}}$.

Q83 MCQ · 1 mark — **2024** – 430(B)

If 3 chairs and 1 table cost ₹ 900 and 5 chairs and 3 tables ₹ 2100, then the cost of one chair is :

(A) ₹ 100 (B) ₹ 110
(C) ₹ 150 (D) ₹ 450

ANSWER *

$3c+t=900, 5c+3t=2100; 9c+3t=2700 \Rightarrow 4c=600 \Rightarrow c=150$

(C) ₹ 150

Q84 Very Short Answer · 2 marks — **2023** – 430(B)

Find two numbers whose sum is 75 and the difference is 25.

ANSWER *

Let the numbers be x and y $(x>y)$: $x+y=75, x-y=25$

Adding: $2x=100 \Rightarrow x=50, y=25$

The numbers are 50 and 25.

Q85 Very Short Answer · 2 marks | Internal choice (OR) part — **2024** – 430/2/1, 430/2/2, 430/2/3

The sum of two natural numbers is 70 and their difference is 10. Find the natural numbers.

ANSWER *

$x+y=70, x-y=10$

$2x=80 \Rightarrow x=40, y=30$

The numbers are 40 and 30.

Q86 Very Short Answer · 2 marks · Internal choice (OR) part — **2026 (II)** – 430/7/1

The difference of two positive numbers is 26 and one number is three times the other. Find the numbers.

ANSWER

Let the numbers be x and y, $x > y$. $x - y = 26$ ½

$x = 3y$ ½

Getting $y = 13$ and $x = 39$. $\therefore$ Required positive numbers are 39 and 13 ½+½

Numbers are 39 and 13

Q87 Very Short Answer · 2 marks · Internal choice (OR) part — **2026 (II)** – 430/7/2

The perimeter of a rectangle is 36 cm. If the length is 4 cm more than the breadth, find the dimensions of the rectangle.

ANSWER

Let the length be a cm and breadth be b cm. Therefore $2(a + b) = 36$ ½

and $a = 4 + b$ ½

Getting $a = 11$ and $b = 7$; $\therefore$ length $= 11$ cm and breadth $= 7$ cm 1

Length 11 cm, breadth 7 cm

Q88 Very Short Answer · 2 marks · Internal choice (OR) part — **2026 (II)** – 430/7/3

The cost of one chair and one table together is ₹ 2,000. If the cost of a table is three times the cost of a chair, then find the cost of one table and the cost of one chair.

ANSWER

Let the cost of one chair be ₹ x and one table be ₹ y. Therefore $x + y = 2000$ ...(i) ½

$y = 3x$ ...(ii) ½

Solving (i) and (ii), $x = 500,\ y = 1500$ ½+½

Chair ₹ 500, table ₹ 1500

Q89 Short Answer · 3 marks · Internal choice (OR) part — **2023** – 430(B)

The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them saves ₹ 2,000 yearly, find their annual incomes.

ANSWER *

Let incomes be $9x,\ 7x$ and expenditures $4y,\ 3y$: $9x - 4y = 2000$, $7x - 3y = 2000$

$27x - 12y = 6000$, $28x - 12y = 8000 \Rightarrow x = 2000$

Incomes: $9x = ₹18000$, $7x = ₹14000$

Annual incomes are ₹ 18,000 and ₹ 14,000.

Q90 Short Answer · 3 marks · Internal choice (OR) part — **2023** – 430/4/2

If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes $\frac{1}{2}$ if

we only add 1 to the denominator. What is the fraction ?

ANSWER *

Let the fraction be $\frac{x}{y}$: $\frac{x+1}{y-1} = 1 \Rightarrow x - y = -2$

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

Subtracting: $x = 3$, $y = 5$; fraction $= \frac{3}{5}$

$\boxed{\frac{3}{5}}$

Q91 Short Answer · 3 marks | Internal choice (OR) part | **2023** – 430/4/1, 430/4/3

A lending library has a fixed charge for first three days and an additional charge for each day thereafter. Rittik paid ₹ 27 for a book kept for 7 days and Manmohan paid ₹ 21 for a book kept for 5 days. Find the fixed charges and the charge for each extra day.

ANSWER *

Let the fixed charge be ₹x and the charge per extra day ₹y: $x + 4y = 27$, $x + 2y = 21$

Subtracting: $2y = 6 \Rightarrow y = 3$

$x = 21 - 6 = 15$

Fixed charge ₹ 15; ₹ 3 per extra day

Q92 Short Answer · 3 marks | Internal choice (OR) part | **2023** – 430/5/1, 430/5/2, 430/5/3

Sabina went to a bank ATM to withdraw ₹ 2,000. She received ₹ 50 and ₹ 100 notes only. If Sabina got 25 notes in all, how many notes of ₹ 50 and ₹ 100 did she receive ?

ANSWER *

Let the number of ₹50 notes be x and ₹100 notes be y: $x + y = 25$, $50x + 100y = 2000 \Rightarrow x + 2y = 40$

Subtracting: $y = 15$

$x = 10$

10 notes of ₹ 50 and 15 notes of ₹ 100

Q93 Short Answer · 3 marks | Internal choice (OR) part | **2023** – 430/5/1, 430/5/2, 430/5/3

Five years ago, Amit was thrice as old as Baljeet. Ten years hence, Amit shall be twice as old as Baljeet. What are their present ages ?

ANSWER *

Let Amit's age be x and Baljeet's y years: $x - 5 = 3(y - 5) \Rightarrow x - 3y = -10$

$x + 10 = 2(y + 10) \Rightarrow x - 2y = 10$

Subtracting: $y = 20$, $x = 50$

Amit 50 years, Baljeet 20 years

Q94 Short Answer · 3 marks | Internal choice (OR) part | **2024** – 430/S/1, 430/S/2, 430/S/3

16 years ago, at the time of marriage, Ajay was 5 years elder to his wife. The present ages of the wife and

Ajay are in the ratio 8 : 9. Find their ages at the time of their marriage.

ANSWER

Let Ajay's age at the time of marriage be x years and wife's age be y years. $x = y + 5$ ...(1) — 1

$\frac{y+16}{x+16} = \frac{8}{9} \Rightarrow 8x - 9y = 16$ ...(2) — 1

Solving (1) and (2), $x = 29$ and $y = 24$ — ½+½

∴ Ajay's age at the time of marriage = 29 years and his wife's age = 24 years

Ajay 29 years, wife 24 years

Q95 Short Answer · 3 marks · Internal choice (OR) part — **2024** – 430(B)/S

Two numbers are in the ratio 5 : 6. If 8 is subtracted from each of the numbers, the ratio becomes 4 : 5. Find the numbers.

ANSWER

Let the numbers be $5x$ and $6x$ — ½

$\frac{5x-8}{6x-8} = \frac{4}{5}$ — 1

$\Rightarrow 25x - 40 = 24x - 32 \Rightarrow x = 8$ — ½

So the numbers are 40 and 48. — 1

Numbers are 40 and 48

Q96 Short Answer · 3 marks — **2024** – 430(B)

A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Sarita paid ₹ 27 for a book kept for seven days, while Ravi paid ₹ 24 for a book he kept for six days. Find the fixed charge and the charge for each extra day.

ANSWER *

Let the fixed charge be ₹x and the charge per extra day ₹y: $x + 4y = 27$, $x + 3y = 24$

Subtracting: $y = 3$

$x = 27 - 12 = 15$

Fixed charge ₹ 15; ₹ 3 per extra day

Q97 Short Answer · 3 marks — **2024** – 430/1/1, 430/1/2, 430/1/3

The greater of two supplementary angles exceeds the smaller by 18°. Find measures of these two angles.

ANSWER *

Let the angles be $x > y$: $x + y = 180^\circ$, $x - y = 18^\circ$

Adding: $2x = 198^\circ \Rightarrow x = 99^\circ$

$y = 81^\circ$

99° and 81°

Q98 Short Answer · 3 marks · Internal choice (OR) part — **2025** – 430/1/1, 430/1/2, 430/1/3

x and y are complementary angles such that $x : y = 1 : 2$. Express the given information as a system of

linear equations in two variables and hence solve it.

ANSWER *

$x + y = 90^\circ$ and $y = 2x$

$3x = 90^\circ \Rightarrow x = 30^\circ$

$y = 60^\circ$

$\boxed{x = 30^\circ,\ y = 60^\circ}$

Q99 Short Answer · 3 marks | Internal choice (OR) part | **2025** – 430/3/1, 430/3/2, 430/3/3

A fraction becomes $\frac{1}{3}$, when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$, when 8 is added to its denominator. Find the fraction.

ANSWER *

Let the fraction be $\frac{x}{y}$: $\frac{x-1}{y} = \frac{1}{3} \Rightarrow y = 3x - 3$

$\frac{x}{y+8} = \frac{1}{4} \Rightarrow 4x = y + 8$

$4x = 3x + 5 \Rightarrow x = 5, y = 12$; fraction $= \frac{5}{12}$

$\boxed{\frac{5}{12}}$

Q100 Short Answer · 3 marks | Internal choice (OR) part | **2026 (I)** – 430(B)

When 1 is subtracted from the numerator and 2 is added to the denominator of a fraction, it becomes $\frac{1}{2}$. When 7 is subtracted from the numerator and 2 is subtracted from the denominator, the fraction becomes $\frac{1}{3}$. Find the fraction.

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ANSWER *

Let the fraction be $\frac{x}{y}$: $\frac{x-1}{y+2} = \frac{1}{2} \Rightarrow y = 2x - 4$

$\frac{x-7}{y-2} = \frac{1}{3} \Rightarrow y = 3x - 19$

$2x - 4 = 3x - 19 \Rightarrow x = 15, y = 26$; fraction $= \frac{15}{26}$

$\boxed{\frac{15}{26}}$

Q101 Short Answer · 3 marks | **2026 (II)** – 430/8/1, 430/8/2, 430/8/3

In a certain fraction, if the numerator is multiplied by 4 and the denominator is decreased by 5, the result becomes $\frac{8}{5}$. But if the numerator is increased by 1 and denominator is increased by 2, the result becomes

$\frac{1}{3}$. Find the original fraction.

ANSWER

Let the fraction be $\frac{x}{y}$. $\frac{4x}{y-5} = \frac{8}{5} \Rightarrow 20x - 8y + 40 = 0$ — 1

and $\frac{x+1}{y+2} = \frac{1}{3} \Rightarrow 3x - y + 1 = 0$ — 1

$x = 8,\ y = 25\ \therefore$ fraction is $\frac{8}{25}$ — 1

Fraction is $\frac{8}{25}$

Q102 Short Answer · 3 marks · Internal choice (OR) part — **2026 (II)** – 430/8/1, 430/8/2, 430/8/3

A 2-digit number is such that its units digit is two less than the tens digit, also the sum of the number and the number formed by reversing the digits is 154. Find the number.

ANSWER

Let units digit be $x - 2$ and tens digit be x — ½

$(10x + x - 2) + [10(x - 2) + x] = 154$ — 1

$22x - 22 = 154 \Rightarrow 22x = 176 \Rightarrow x = 8$ — ½

Unit's place = 6 and ten's place = 8; ∴ Number = 86 — 1

Number = 86

Q103 Short Answer · 3 marks · Internal choice (OR) part — **2026 (II)** – 430(B)

Two places A and B are 100 km apart on a highway. A car starts from A and another from B at the same time. If they move in the same direction, they meet in 5 hours, and if they move in opposite directions, they meet in 1 hour and 15 minutes. Find the speed of each car.

ANSWER

Let x km/h be the speed of the car starting from A and y km/h of the car starting from B. $5x - 5y = 100$ — 1

$\frac{5}{4}x + \frac{5}{4}y = 100 \Rightarrow x + y = 80$ — 1

On solving, $x = 50$ and $y = 30$; the speed of the car starting from A is 50 km/h and the car starting from B is 30 km/h. — 1

Car from A 50 km/h, car from B 30 km/h

Q104 Long Answer · 5 marks · Internal choice (OR) part — **2023** – 430/C/1

5 chairs and 1 table together cost ₹ 1,750; while 4 chairs and 3 tables together cost ₹ 1,950. Find the cost of one chair and of one table. What would be the total cost of 10 chairs and 10 tables ?

ANSWER

Let the cost of one chair be ₹ x and that of one table be ₹ y. $5x + y = 1750$ ...(i) — 1

$4x + 3y = 1950$ ...(ii) — 1

Solving (i) and (ii), $x = 300$ and $y = 250$ — 1+1

Total cost of 10 chairs and 10 tables $= 10 \times (300 + 250) =$ ₹ 5500 — 1

Chair ₹ 300, table ₹ 250; total ₹ 5500

Q105 Long Answer · 5 marks · Internal choice (OR) part — **2023** – 430/C/2

36 pens and 24 pencils together cost ₹ 780, while 24 pens and 36 pencils together cost ₹ 720. Find the cost of one pen and of one pencil.

ANSWER

Let the cost of each pen = ₹ x and the cost of each pencil = ₹ y. $\therefore\ 36x + 24y = 780$ or $3x + 2y = 65$ — 1½

and $24x + 36y = 720$ or $2x + 3y = 60$ — 1½

Solving and getting $x = 15$ and $y = 10$; $\therefore$ cost of each pen = ₹ 15 and the cost of each pencil = ₹ 10 — 1+1

Pen ₹ 15, pencil ₹ 10

Q106 Long Answer · 5 marks · Internal choice (OR) part — **2023** – 430/C/3

7 chairs and 4 tables for a classroom together cost ₹ 7,000; while 5 chairs and 3 tables together cost ₹ 5,080. Find the cost of each chair and each table.

ANSWER

Let the cost of one chair be ₹ x and that of one table be ₹ y. $7x + 4y = 7000$ ...(i) — 1½

$5x + 3y = 5080$ ...(ii) — 1½

Solving (i) and (ii), $x = 680$ and $y = 560$; cost of each chair = ₹ 680 and cost of each table = ₹ 560 — 1+1

Chair ₹ 680, table ₹ 560

Q107 Long Answer · 5 marks · Internal choice (OR) part — **2024** – 430/3/1, 430/3/2, 430/3/3, 430/5/3

The sum of the digits of a 2-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number.

ANSWER *

Let ten's digit be x and unit's digit y: $x + y = 9$

$9(10x + y) = 2(10y + x) \Rightarrow 88x = 11y \Rightarrow y = 8x$

$x + 8x = 9 \Rightarrow x = 1, y = 8$

The number is 18

The number is 18.

Q108 Long Answer · 5 marks — **2024** – 430/5/1

The ratio of monthly incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them manages to save ₹ 2,000 per month, then find their monthly incomes.

ANSWER *

Let incomes be $9x,\ 7x$ and expenditures $4y,\ 3y$: $9x - 4y = 2000,\ 7x - 3y = 2000$

Multiplying by 3 and 4: $27x - 12y = 6000,\ 28x - 12y = 8000$

Subtracting: $x = 2000$ (and $y = 4000$)

Monthly incomes: $9x =$ ₹18000, $7x =$ ₹14000

Monthly incomes are ₹ 18,000 and ₹ 14,000.

Q109 Long Answer · 5 marks **2024** – 430/5/2

A fraction becomes $\frac{3}{4}$, if 2 is added to the numerator and 1 is added to the denominator. If 2 is subtracted from the numerator and 1 is subtracted from the denominator, it becomes $\frac{1}{2}$. Find the fraction.

ANSWER *

Let the fraction be $\frac{x}{y}$: $\frac{x+2}{y+1} = \frac{3}{4} \Rightarrow 4x - 3y = -5$

$\frac{x-2}{y-1} = \frac{1}{2} \Rightarrow 2x - y = 3$

$y = 2x - 3 \Rightarrow 4x - 6x + 9 = -5 \Rightarrow x = 7, y = 11$

Fraction $= \frac{7}{11}$

$\boxed{\frac{7}{11}}$

Q110 Long Answer · 5 marks Internal choice (OR) part **2025** – 430/6/1, 430/6/2, 430/6/3

Nidhi received simple interest of ₹ 1,200 when invested ₹ x at 6% p.a. and ₹ y at 5% p.a. for 1 year. Had she invested ₹ x at 3% p.a. and ₹ y at 8% p.a. for that year, she would have received simple interest of ₹ 1,260. Find the values of x and y.

ANSWER *

$\frac{6x}{100} + \frac{5y}{100} = 1200 \Rightarrow 6x + 5y = 120000$

$\frac{3x}{100} + \frac{8y}{100} = 1260 \Rightarrow 3x + 8y = 126000$

Doubling the second and subtracting: $11y = 132000 \Rightarrow y = 12000$

$6x = 120000 - 60000 \Rightarrow x = 10000$

$\boxed{x = ₹10{,}000,\ y = ₹12{,}000}$

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Q111 Long Answer · 5 marks Internal choice (OR) part **2026 (I)** – 430/4/1, 430/4/2, 430/4/3

The difference between two numbers is 12. The greater number is 6 less than twice the smaller one. (i) Representing the above situation, frame two linear equations in two variables. (ii) Show that the equations have unique solution. (iii) Solve the equations and hence find the numbers.

ANSWER *

(i) Let the greater be x, smaller y: $x - y = 12$, $x = 2y - 6$ i.e. $x - 2y = -6$

(ii) $\frac{1}{1} \neq \frac{-1}{-2}$: unique solution

(iii) Subtracting: $y = 18$, $x = 30$

The numbers are 30 and 18.

Q112 Case Study · 4 marks **2023** – 430/6/1, 430/6/3

Case study: Lokesh, a production manager in Mumbai, hires a taxi everyday to go to his office. The taxi charges in Mumbai consists of a fixed charges together with the charges for the distance covered. His office is at a distance of 10 km from his home. For a distance of 10 km to his office, Lokesh paid ₹ 105. While coming back home, he took another route. He covered a distance of 15 km and the charges paid by him were ₹ 155.

(i) What are the fixed charges ? **[1]**
(ii) What are the charges per km ? **[1]**
(iii) If fixed charges are ₹ 20 and charges per km are ₹ 10, then how much Lokesh have to pay for travelling a distance of 10 km ? **[2]**
OR
(iii) Find the total amount paid by Lokesh for travelling 10 km from home to office and 25 km from office to home. [Fixed charges and charges per km are as in (i) & (ii).] **[2]**

ANSWER *
Let the fixed charge be ₹x and charge per km ₹y: $x + 10y = 105$, $x + 15y = 155 \Rightarrow y = 10,\ x = 5$
(i) Fixed charges = ₹ 5
(ii) Charges per km = ₹ 10
(iii) $20 + 10 \times 10 = ₹120$
OR (iii) $(5 + 10 \times 10) + (5 + 25 \times 10) = 105 + 255 = ₹360$

Q113 Case Study · 4 marks **2024** – 430/4/1, 430/4/2, 430/4/3

Case study: Deepankar bought 3 notebooks and 2 pens for ₹ 80 and his friend Suryansh bought 4 notebooks and 3 pens for ₹ 110 from the school bookshop.
(i) If the price of one notebook be ₹ x and the price of one pen be ₹ y, write the given situation algebraically. **[1]**
(ii) (a) What is the price of one notebook ? **[2]**
OR
(ii) (b) What is the price of one pen ? **[2]**
(iii) What is the total amount to be paid by Suryansh, if he purchases 6 notebooks and 3 pens ? **[1]**

ANSWER *
(i) $3x + 2y = 80,\ 4x + 3y = 110$
(ii)(a) $9x + 6y = 240,\ 8x + 6y = 220 \Rightarrow x = 20$; price of one notebook = ₹20
OR (ii)(b) $2y = 80 - 60 \Rightarrow y = 10$; price of one pen = ₹10
(iii) $6(20) + 3(10) = ₹150$

Q114 Case Study · 4 marks **2025** – 430/4/1, 430/4/2, 430/4/3

Case study: A telecommunication company came up with two plans– plan A and plan B for its customers. The plans are represented by linear equations where 't' represents the time (in minutes) bought and 'C' represents the cost. The equations are :
Plan A : $3C = 20t$ Plan B : $3C = 10t + 300$
(i) If you purchase plan B, how much initial amount you have to pay ? **[1]**
(ii) Charu purchased plan A. How many minutes she bought for ₹ 250 ? **[1]**
(iii) (a) At how many minutes, do both the plans charge the same amount? What is that amount? **[2]**
OR
(iii) (b) Which plan is better if you want to buy 60 minutes? Give reason for your answer. **[2]**

ANSWER *
(i) Put $t = 0$ in plan B: $3C = 300 \Rightarrow C = ₹100$
(ii) $3(250) = 20t \Rightarrow t = 37.5$ minutes
(iii)(a) $20t = 10t + 300 \Rightarrow t = 30$ minutes; $C = \dfrac{20 \times 30}{3} = ₹200$
OR (iii)(b) For $t = 60$: plan A costs ₹400, plan B costs ₹300; plan B is better (cheaper).

Q115 Case Study · 4 marks **2026 (I)** – 430/5/1, 430/5/3

Case study: Seema daily goes to a park to exercise on machines available there. When Seema spent 15 minutes on exercise bicycle and 30 minutes on double cross walker, she received a message of burning 435 calories on her fitness watch. When she spent 30 minutes on exercise bicycle and 40 minutes on double cross walker, she received a message of burning 690 calories. To find the number of calories burned per minute on each machine, answer the following :

(i) Represent the above situation in terms of a pair of linear equations in two variables. **[1]**

(ii) Show that the equations have unique solution. **[1]**

(iii) (a) Solve both equations to find the values of the variables using elimination method. **[2]**

OR

(iii) (b) Solve both equations to find the values of the variables using substitution method. **[2]**

ANSWER *

(i) Let calories burned per minute be x (bicycle) and y (cross walker): $15x + 30y = 435$, $30x + 40y = 690$, i.e. $x + 2y = 29$, $3x + 4y = 69$

(ii) $\frac{1}{3} \neq \frac{2}{4}$: unique solution

(iii)(a) $2(x + 2y) = 58$; $(3x + 4y) - (2x + 4y) = 69 - 58 \Rightarrow x = 11, y = 9$

OR (iii)(b) $x = 29 - 2y \Rightarrow 3(29 - 2y) + 4y = 69 \Rightarrow y = 9, x = 11$

Bicycle: 11 calories/min; cross walker: 9 calories/min

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