

4. Splitting the middle term.

To factorise $x^2 + bx + c$ into factors of form $(x + p)$ and $(x + q)$, we find the numbers p and q such that $p + q = b$ and $p \times q = c$.

$$\begin{aligned} \text{So that, } & x^2 + bx + c \\ &= x^2 + (p + q)x + p \times q \\ &= x^2 + px + qx + pq \\ &= x(x + p) + q(x + p) \\ &= (x + p)(x + q) \end{aligned}$$

Fill in the blank boxes

(a) $x^2 + 7x + 12$

$$= x^2 + \boxed{}x + \boxed{}x + 12$$

$$= x(x + \boxed{}) + (x + \boxed{})$$

$$= (x + \boxed{})(x + \boxed{})$$

(b) $6x^2 + 19x + 10$

Product of factors = 60

Sum of factors = 19

$$= 6x^2 + \boxed{}x + \boxed{}x + 10$$

$$= 3x(2x + \boxed{}) + \boxed{}(2x + \boxed{})$$

$$= (3x + \boxed{})(2x + \boxed{})$$



(c) $6x^2 + 13x - 8$

Product of factors =

Sum of factors =

$$= 6x^2 + \quad \square \quad x + \quad \square \quad x - 8$$

$$= 2x (3x + \quad \square \quad) - 1 (3x + \quad \square \quad)$$

$$= (2x - 1) (3x + \quad \square \quad)$$

5. Find the mistake.

(i) $2x^2 - 9 - 3x$

$$= 2x^2 - 3x - 9$$

$$= 2x^2 + 6x - 3x - 9$$

$$= 2x(x + 3) - 3(x + 3)$$

$$= (x + 3)(2x - 3)$$

(ii) $2x^2 - 9 - 3x$

$$= 2x^2 - 3x - 9$$

$$= 2x^2 - 6x - 3x - 9$$

$$= 2x(x - 3) - 3(x - 3)$$

$$= (2x - 3)(x - 3)$$

6. Find the zeroes of a quadratic polynomial $5x^2 - 4 - 8x$ and verify the relationship between the zeroes and the coefficients.

Step-1 : Using splitting the middle term method factorise $p(x) = 5x^2 - 4 - 8x$

$$p(x) = 5x^2 - 4 - 8x$$

$$= 5x^2 - \quad \square \quad x + \quad \square \quad x - 4$$

$$= 5x(x - \quad \square \quad) + 2(x - \quad \square \quad)$$

$$= (5x + 2) (\quad \square \quad - \quad \square \quad)$$



Step-2 : To get zeroes $p(x) = 0$

zeroes are _____ , _____

Sum of zeroes = _____ + _____ = (1)

$-(\text{Coefficient of } x)$ (2)

$\frac{\text{Coefficient of } x^2}{\text{Coefficient of } x^2}$ = $\frac{\text{Coefficient of } x^2}{\text{Coefficient of } x^2}$

Compare (1) & (2)

Are they equal ?

Product of zeroes = _____ \times _____ = (3)

$\frac{\text{Constant term}}{\text{Coefficient of } x^2}$ = $\frac{\text{Constant term}}{\text{Coefficient of } x^2}$ (4)

Compare (3) & (4)

Are they equal ?



7. Find the zeroes of $x^2 - 2$ and verify the relationship between the zeroes and the coefficients.

Step-1 : $x^2 - 2 = x^2 - (\square)^2$

$$= (x + \square)(x - \square) \quad [\text{Which formula have you used?}]$$

Step-2 : Zeroes are _____ and _____

Step-3 : Sum of zeroes = _____

$$\frac{-(\text{Coefficient of } x)}{\text{Coefficient of } x^2} = \frac{\square}{\square}$$

Step-4 : Product of zeroes = _____

$$\frac{\text{Constant term}}{\text{Coefficient of } x^2} = \frac{\square}{\square}$$



CHAPTER-3

Pair of Linear Equations in Two Variables

Learning Objectives

- Recall, general form of a linear equation in two variables
- To learn to frame a pair of linear equations in two variables from daily life examples
- To solve a pair of linear equations in two variables graphically
- To analyze meaning of type of solution (unique, infinite many, no solution), type of graph (intersecting lines, parallel lines, coincident lines), consistent/inconsistent
- To learn to solve pair of linear equations in two variables by elimination method, substitution method and cross multiplication method
- To learn to apply the knowledge of pair of linear equations

Task-1: Forming a pair of linear equations in two variables

Topic	Pair of linear equations in two variables
Nature of task	Pre Content
Content Coverage	Formation of linear equations in two variables
Learning Objectives	To convert a word problem into a pair of linear equations in two variables
Task	Forming a pair of linear equations in two variables
Execution of task	To be done in the classroom. It can be done as a group activity also. Students may work in groups of 4 students. Teacher may give one card each to one group containing a worded Maths problem. Students will be asked to assume variables and transform the given situations into equations. Teacher can then discuss each situation and help them learn to find solution. This task shall continue till all types are covered.
Duration	4 periods
Criteria for assessment	It is a part of regular C.W. assessment.
Follow up	Discussion and explanation in classroom. Individual difficulties can be taken up separately.



Some Suggested Example Cards

Card 1

Leela tells her daughter “seven years ago, I was seven times as old were you then. Also, three years from now, I shall be three times as old as you will be”

Transform the given situation to form a pair of linear equations in two variables.

Hint: Assume present ages of both of them and proceed.

Card 2

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

Transform the given situation to form a pair of linear equations in two variables.

Hint: If a two digit number is xy then how do you express it?

Recall, $26 = 2 \times 10 + 6 \times 1$

$34 = 3 \times 10 + 4 \times 1$

$43 = 4 \times 10 + 3 \times 1$

Card 3

The cost of 2kg of apples & 1kg of grapes on a day was found to be Rs.160. After a month; cost of 4kg of apples & 2kg of grapes is Rs.300. Represent this situation algebraically.



Card 4

The coach of a cricket team buys 3 bats & 6 balls for Rs.3900. Later, she buys 1 bat & 2 more balls of the same kind for Rs.1300. Represent this situation algebraically.



Like this cards can be prepared.



Task-2: Graphical method of solving a pair of linear equations in two variables

Topic	Pair of linear equations in two variables
Nature of task	Content
Content Coverage	Plotting the pair of equations on graph Finding solution (if any) Conditions for consistency or inconsistency
Learning Objectives	To learn to plot two equations on graph To learn to find solution (if any) To analyze graphs
Task	Graphical method of solving a pair of linear equations in two variables
Execution of task	Teacher will explain important points about graphing equations, labeling axes, making a table of points satisfying each equation. Students may be given a class worksheet to plot pair of linear equations in two variables.
Duration	2 periods
Criteria for assessment	It is a part of regular C.W. assessment.
Follow up	Discussion and explanation in classroom.

Solve graphically:

$$2x + 3y = 6$$

$$3x + 2y = 6$$

Thinking questions:

- What type of lines is obtained?
- Are the lines making a triangle with any of coordinate axes?
- What is the ratio of coefficients of x, coefficients of y and constant in both the given equations?
- Is the ratio of ratio of coefficients of x and coefficients of y unequal? What do you think is the impact of this ratio on the graph?
- What is the solution of given pair of linear equations in two variables?

Now, draw the graphs of $2x + 3y = 6$ and $4x + 6x = 18$ on the same coordinate plane. What specific do you notice about the type of graph, type of pair of equations, solution (if any).



- What type of lines is obtained?
- Are the lines making a triangle with any of coordinate axes?
- What is the ratio of coefficients of x, coefficients of y and constant in both the given equations?
- What do you think is the impact of this ratio on the graph?
- What is the solution of given pair of linear equations in two variables?

Now, draw the graphs of $2x + 3y = 6$ and $4x + 6x = 12$ on the same coordinate plane. What specific do you notice about the type of graph, type of pair of equations, solution (if any).

- What type of lines is obtained?
- Are the lines making a triangle with any of coordinate axes?
- What is the ratio of coefficients of x, coefficients of y and constant in both the given equations?
- What do you think is the impact of this ratio on the graph?
- What is the solution of given pair of linear equations in two variables?

Task-3: Math Lab – Graphical method of solving a pair of linear equations in two variables

Topic	Pair of linear equations in two variables
Nature of task	Content
Content Coverage	Plotting the pair of equations on graph
	Finding solution (if any) Conditions for consistency or inconsistency
Learning Objectives	To analyze graphs
Task	Graphical method of solving a pair of linear equations in two variables
Execution of task	This task will be done in the Maths lab. Students will draw graphs and answer the questions after each activity. Questions may be taken as an assessment task.
Duration	3 periods for 3 suggested activities.
Criteria for assessment	Follow Math lab rubric for assessment.
Follow up	Discussion and explanation in classroom.



Activity Task 1**Aim**

To find the condition for consistency or inconsistency for a given set of system of Linear Equations in two variables.

Material Required

Graph paper and Geometry box

$$\begin{array}{ll} \text{Set I} & 2x - y + 8 = 0, \quad 8x + 3y - 24 = 0 \\ \text{Set II} & x + 2y = 3, \quad 4x + 3y = 2 \end{array}$$

Procedure

- Step 1** For first set of equations, make table of ordered pairs (x, y) satisfying each of the given equations.
- Step 2** Draw the graph of both the equations on the same graph paper.
- Step 3** Similarly consider the second set of equations and draw the graph.
- Step 4** Observe the ratio of coefficients of x , ratio of coefficients of y and ratio of coefficients of constant terms.
- Step 5** Observe the type of graph.
- Step 6** Write the result.

Observation Table: a_1/a_2 is ratio of coefficients of x in both equations, b_1/b_2 is ratio of coefficients of y in both equations, c_1/c_2 is ratio of constant terms in both equations.

Set of equations	a_1/a_2	b_1/b_2	c_1/c_2	Type of graph	Type of solution	Conclusion
$2x - y = 8$ $8x + 3y = -24$						
$x + 2y = 3$ $4x + 3y = 2$						

After doing activity task 1 answer the following questions:

- Q1.** Write the condition for having a unique solution in the following pair of linear equations in two variables $lx + my = p$ and $tx + ny = r$.
- Q2.** Without actually drawing graph can you comment on type of graph of a given pair of linear equations in two variables?
- Q3.** If ratio of coefficients of x is not equal to ratio of coefficients of y in a given pair of linear equations in two variables then what will be the type of graph?



After doing activity task 2 answer the following questions:

- Q1.** Write the condition for having infinitely many solution in the following pair of linear equations in two variables $lx + my = p$ and $tx + ny = r$.
- Q2.** Without actually drawing graph can you comment on type of graph of a given pair of linear equations in two variables?
- Q3.** If ratio of coefficients of x is equal to ratio of coefficients of y and also equal to ratio of constant terms in a given pair of linear equations in two variables then what will be the type of graph ?
- Q4.** Write 2 more equations of lines coincident with $5x + 7y = 20$.
- Q5.** Comment on type of solution and type of graph of following pair of linear equations:
 $2x - 5y = 9$, $4x - 10y = 18$.
- Q6.** For what value of k the pair of equations $x + (k + 1)y = 5$, $(k + 1)x + 9y = 8k - 1$ has infinitely many solutions.
- Q7.** Comment on the consistency or inconsistency of a pair of linear equations in two variables having coincident lines on graph.
- Q8.** Find the value of k for which the pair of equations $2x + 3y = 7$, $(k - 1)x + (k + 2)y = 3k$ has infinitely many solutions

Activity Task 3

Aim

To find the condition for consistency and inconsistency for a given set of system of Linear Equations in two variables.

Material Required

Graph paper and Geometry box

Set I $x + 2y - 4 = 0$, $x + 2y - 6 = 0$

Set II $2x + 4y = 10$, $3x + 6y = 12$

Procedure

Step 1 : For first set of equations, make table for each of the given equations.

Step 2 : Draw the graph of both the equations on the same graph paper.

Step 3 : Similarly consider the second set of equations and draw the graph.

Step 4 : Observe the ratio of coefficients of x , ratio of coefficients of y and ratio of coefficients of constant terms.

Step 5 : Observe the type of graph.

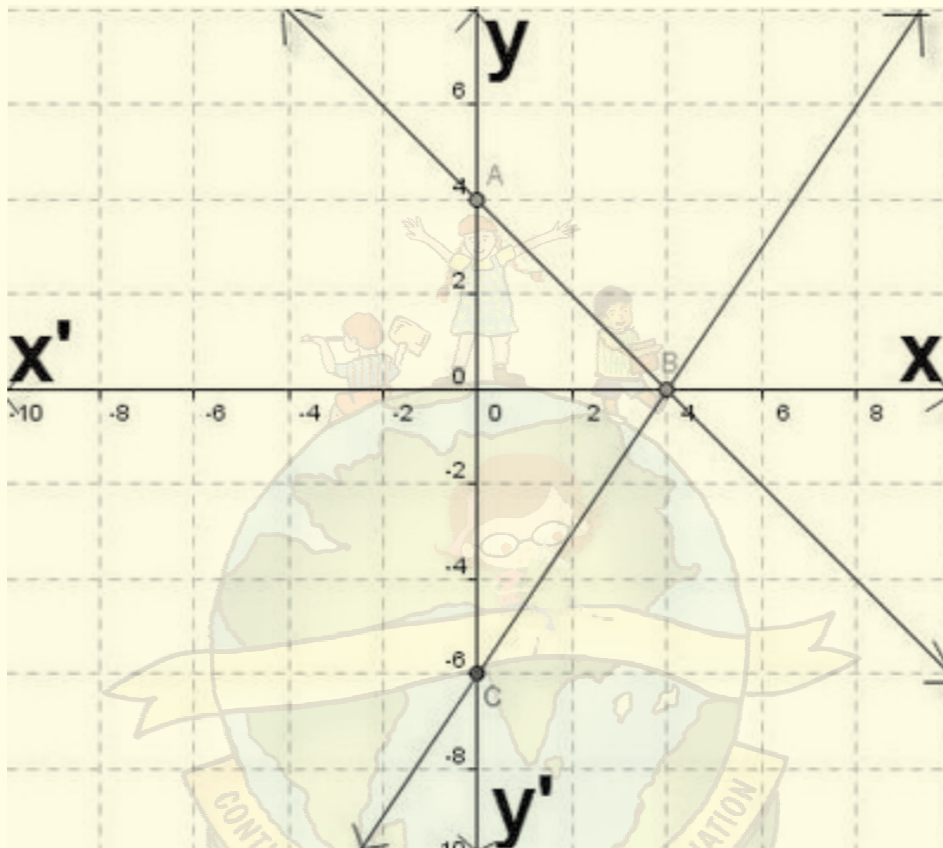
Step 6 : Write the result.



(I) Given below is a graph representing pair of linear equations in two variables.

$$x + y = 4, \quad 3x - 2y = 12$$

Observe the following carefully...

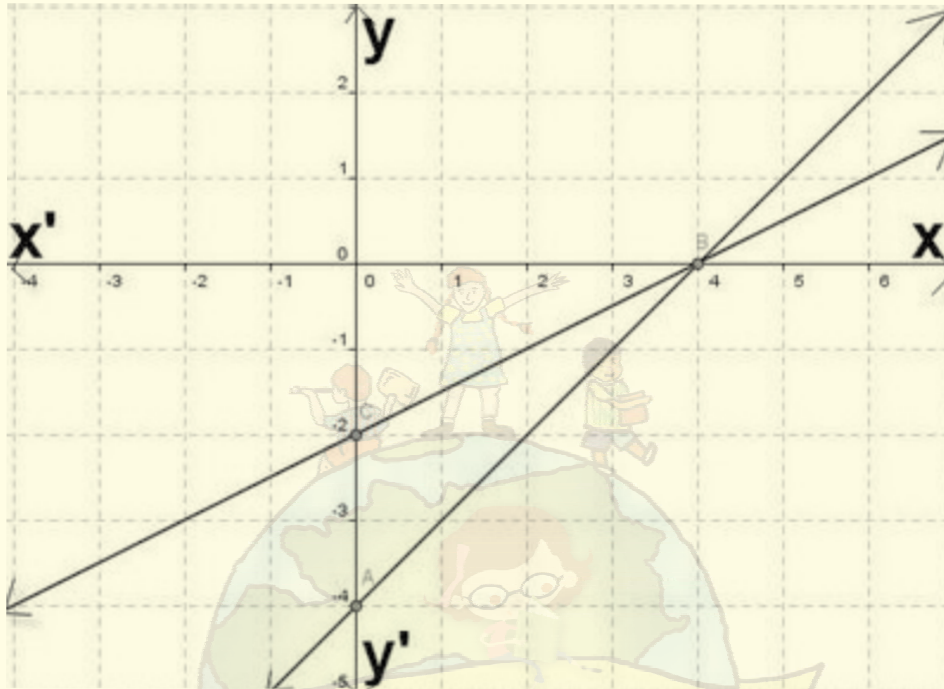


- The two lines represented by given equations intersect at $(4,0)$ which is the solution of given pair of linear equations in two variables.
- Coordinates of points where lines cut the y-axis are $A(0, 4)$ and $C(0, -6)$
- Vertices of triangle formed by given lines and y-axis are $A(0, 4)$, $B(4, 0)$ and $C(0, -6)$
- The area of triangle $ABC = \frac{1}{2} (10 \times 4) = 20$ square units



(II) Given below is the graph representing pair of linear equations in two variables

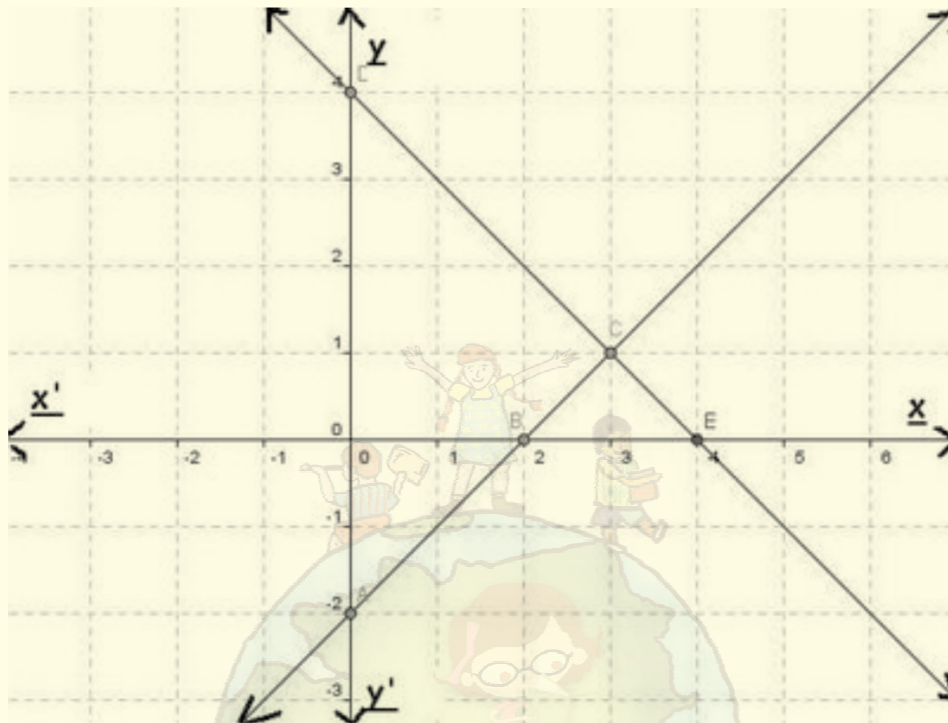
$$x - y = 4, x - 2y = 4.$$



- The two lines represented by given equations intersect at $(4, 0)$ which is the solution of given pair of linear equations in two variables.
- Coordinates of points where lines cut the y -axis are $A(0, -4)$ and $C(0, -2)$
- Vertices of triangle formed by given lines and y -axis are $A(0, -4)$, $B(4, 0)$ and $C(0, -2)$
- The area of triangle $ABC = \frac{1}{2} (2 \times 4) = 4$ square units



(III) Given below is a graph representing pair of linear equations in two variables $x - y = 2$, $x + y = 4$

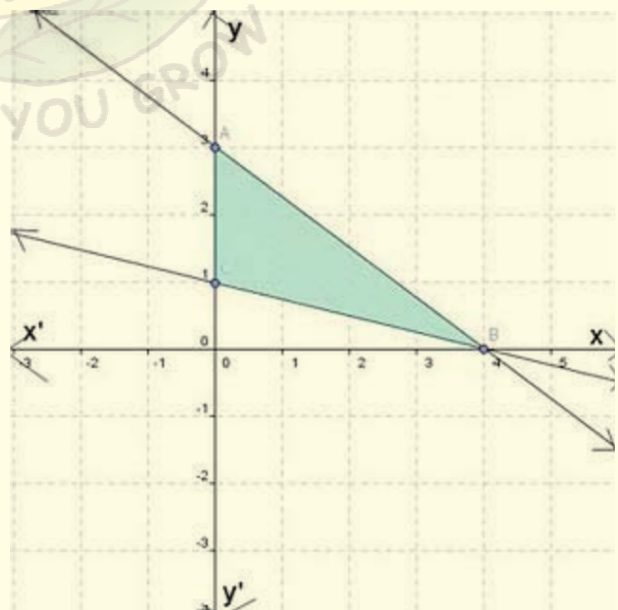
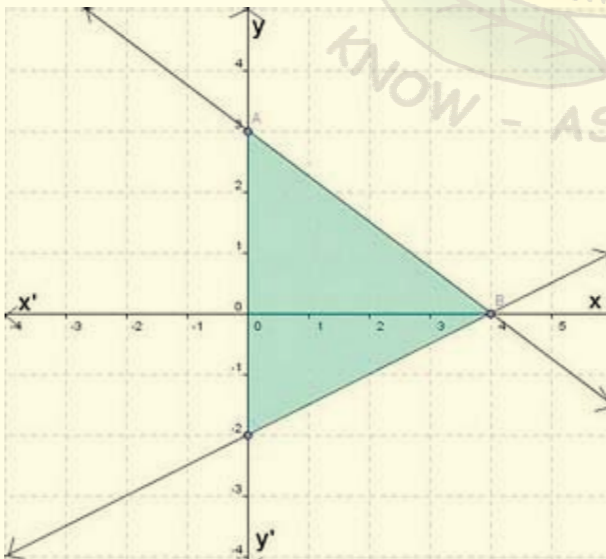
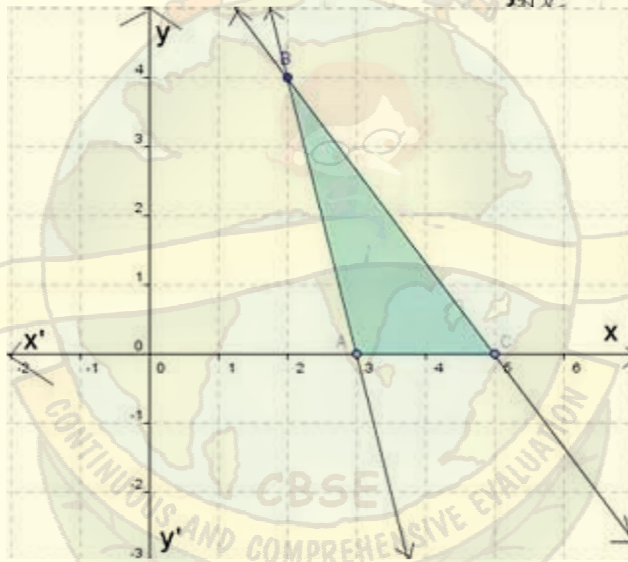
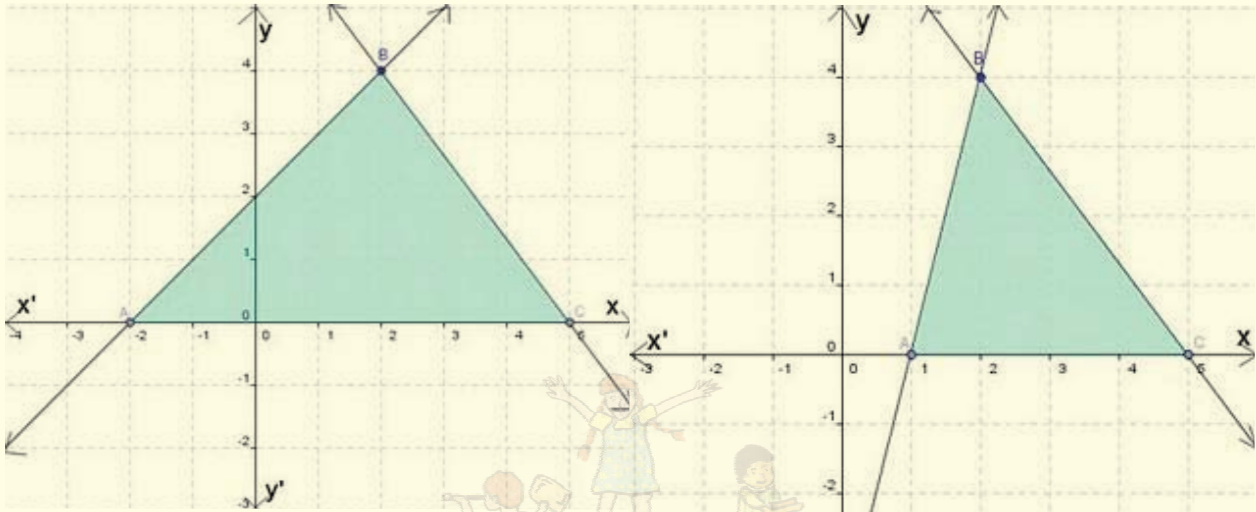


Answer the following questions:

1. What are the coordinates of points where two lines representing the given equations meet x -axis ?
2. What are the coordinates of points where two lines representing the given equations meet y -axis ?
3. What is the solution of given pair of equations? Read from graph.
4. What is the area of triangle formed by given lines and x -axis ?
5. What is the area of triangle formed by given lines and y -axis ?



(IV) What is the area of shaded region in each of the following graphs?



Task-5: Elimination Method (Remedial Task)

Topic	Pair of linear equations in two variables
Nature of task	Content delivery
Content Coverage	Solving a pair of linear equations in two variables algebraically
Learning Objectives	To learn to solve given pair of linear equations in two variables by elimination method
Task	Worksheet
Execution of task	After explaining the concept, a practice worksheet for 15 minutes can be given as a diagnostic purpose.
Duration	1 period
Criteria for assessment	It is a part of regular C.W. assessment.
Follow up	Discussion and explanation in classroom.

Task Elimination method

1. Consider the pair of equations

$$2x + 3y = 6 \quad \dots\dots (1)$$

$$3x - 4y = 7 \quad \dots\dots (2)$$

To make the coefficients of x same in both the equations you will multiply equation (1) by ----- and equation (2) by -----

Write the new pair of equations formed.



2. Consider the pair of equations

$$x + 3y = 6 \quad \dots\dots (1)$$

$$3x - 12y = 5 \quad \dots\dots (2)$$

To make the coefficients of x same in both the equations you will multiply equation (1) by -----and equation (2) by -----

Write the new pair of equations formed.



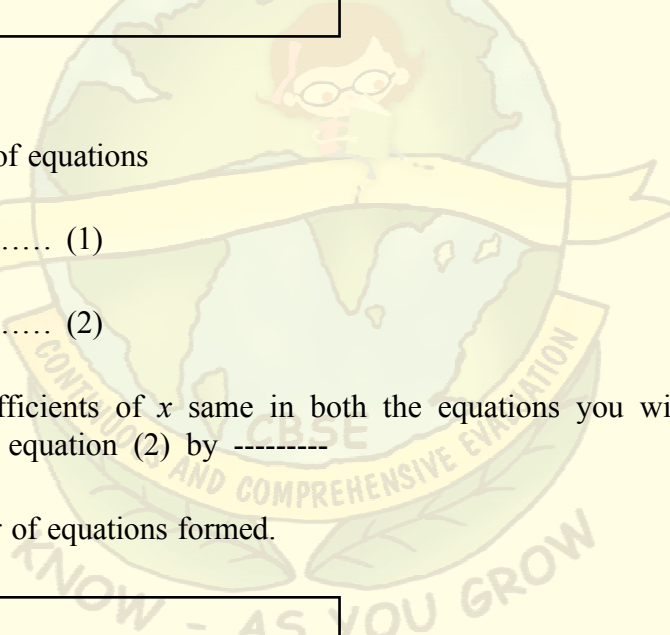
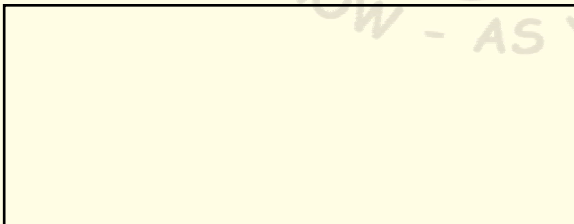
3. Consider the pair of equations

$$-x + 3y = 8 \quad \dots\dots (1)$$

$$4x + 7y = 25 \quad \dots\dots (2)$$

To make the coefficients of x same in both the equations you will multiply equation (1) by -----and equation (2) by -----

Write the new pair of equations formed.



4. Consider the pair of equations

$$2x + 3y = 5 \quad \dots\dots (1)$$

$$10x - 21y = 17 \quad \dots\dots (2)$$

To make the coefficients of x same in both the equations you will multiply equation (1) by -----and equation (2) by -----

Write the new pair of equations formed.



5. Consider the pair of equations

$$11x + 3y = 15 \quad \dots\dots (1)$$

$$20x - 21y = 17 \quad \dots\dots (2)$$

To make the coefficients of x same in both the equations you will multiply equation (1) by -----and equation (2) by -----

Write the new pair of equations formed.



6. Solve the given pairs of linear equations in two variables by elimination method.



$$\text{Solve } 2x + 7y = 12$$

$$5x + 2y = 14$$

Solution

$$\text{We have } 2x + 7y = 12 \quad \text{----(1)}$$

$$5x + 2y = 14 \quad \text{----(2)}$$

First of all we will make the coefficients of x same in both the given equation

Here, we multiple equation (1) by 5 and equation (2) by 2.

We get,

$$\boxed{} + \boxed{} = \boxed{} \quad \text{----(3)}$$

$$\boxed{} + \boxed{} = \boxed{} \quad \text{----(4)}$$

--- subtracting (4) from (3)

$$\boxed{} y = \boxed{}$$

$$y = \boxed{} / \boxed{} \quad \text{----(5)}$$

Now, put (5) in (1) to get the value for x.

$$2x + 7 \left(\boxed{} / \boxed{} \right) = 12$$

$$2x + \left(\boxed{} / \boxed{} \right) = 12$$

$$2x = 12 - \left(\boxed{} / \boxed{} \right)$$

$$2x = \left(\boxed{} - \boxed{} \right) / \boxed{}$$

$$x = \boxed{} / \boxed{}$$

$$= \boxed{} / \boxed{}$$

$$\text{Ans } x = \boxed{} / \boxed{}, y = \boxed{} / \boxed{}$$

$$\text{L.H.S} = 5x + 2y$$

$$= (370/31) + (64/31)$$

Like this other tasks based on substitution method and cross multiplication method can be prepared.



Task-6: Home Assignment

Topic	Pair of linear equations in two variables
Nature of task	Post Content
Content Coverage	Complete Chapter
Learning Objectives	Mentioned earlier
Task	Assignment
Execution of task	To be done by students at home.
Duration	2 days
Criteria for assessment	It is a part of regular H.W. assessment.
Follow up	Suggest correction work to students (if any)

Home Assignment

- Show that $x = 4$ and $y = 5$ is not a solution of pair of the equations $x - 3y = 1$, $2x + y = 11$.
- Solve for x and y :

$$x + \frac{6}{y}, \quad 3x - \frac{8}{y} = 5$$

- If $28x + 17y = 63$ and $17x + 28y = 62$, find the value of $x + y$ and $x - y$.
- Show that the pair of equations $3x + 4y = 7$, $12x + 16y = 28$ have infinitely many solutions.
- Show that the system of equations :

$$3x + 4y = 8 \text{ and } 6x + 8y = 10 \text{ is inconsistent.}$$

- Find the value of k for which the pair of equations

$$2x + 5y = 0, \quad kx + 10y = 0$$

has a non-zero solution.

- Solve for x and y :

$$\frac{x}{2} + y = 0.8, \quad \frac{7}{x + \frac{y}{2}} = 10$$



8. Solve for x and y :

$$2(ax - by) + (a + 4b) = 0, 2(bx + ay) + (b - 4a) = 0$$

9. Solve for x and y :

$$\frac{5}{x-1} + \frac{1}{y-2} = 2, \quad \frac{6}{x-1} - \frac{3}{y-2} = 1$$

10. Solve for x and y :

$$\frac{x+y}{xy} = 1, \quad \frac{x-y}{xy} = 5$$

11. The sum of the numerator and denominator of a fraction is 12. If the denominator is increased by 3, the fraction becomes $\frac{1}{2}$. Find the fraction.
12. A two digit number is four times the sum of the digits and twice the product of the digits. Find the number.

Task-7: MCQ Worksheet

Topic	Pair of linear equations in two variables
Nature of task	Post Content
Content Coverage	Complete Chapter
Learning Objectives	Mentioned earlier
Task	MCQ Worksheet
Execution of task	Teacher may give printed worksheets in the classroom. It is not necessary to allot marks to this task. Answers to questions may be discussed at the end.
Duration	1 Period
Criteria for assessment	Follow rubric classwork assessment.
Follow up	Discussion after the test.



MCQ Worksheet

1. The pair of equations:

$$3x + 4y = 18$$

$$4x + \frac{16}{3}y = 24$$

has

- (A) No Solution (B) Unique Solution
(C) Infinitely many Solution (D) Can not say anything

2. If the pair of equations $2x + 3y = 7$ and $kx + \frac{9}{2}y = 12$ have no solution, then the value of k is :

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

3. The equations $x - y = 0.9$ and $\frac{11}{x+y} = 2$ have the solution :

- (A) $x = 5, y = 1$ (B) $x = 3, 2$ and $y = 2, 3$
(C) $x = 3, y = 2$ (D) $y = 3, 2$ and $y = 2, 3$

4. If $bx + ay = a^2 + b^2$ and $ax - by = 0$, then the value of $(x - y)$ is :

- (A) $a - b$ (B) $b - a$ (C) $a^2 - b^2$ (D) $b^2 + a^2$

5. If $2x + 3y = 0$ and $4x - 3y = 0$, then $x + y$ equals :

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

6. If $\sqrt{a}x - \sqrt{b}y = b - a$ and $\sqrt{b}x - \sqrt{a}y = 0$, then value of x, y is :

- (A) $a + b$ (B) $a - b$ (C) \sqrt{ab} (D) $-\sqrt{ab}$

7. If $\frac{2}{x} + \frac{3}{y} = 13$ and $\frac{5}{x} - \frac{4}{y} = -2$, then $(x + y)$ equals :

- (A) $\frac{1}{6}$ (B) $-\frac{1}{6}$ (C) $\frac{5}{6}$ (D) $-\frac{5}{6}$



8. If $31x + 43y = 117$ and $43x + 31y = 105$, then the value of $(x - y)$ is :
- (A) -3 (B) $\frac{1}{3}$ (C) $-\frac{1}{3}$ (D) 3
9. If $19x - 17y = 55$ and $17x - 19y = 53$, then the value of $(x - y)$ is :
- (A) -3 (B) $\frac{1}{3}$ (C) 3 (D) 5
10. If $\frac{x}{2} + y = 0.8$ and $\frac{7}{\left(x + \frac{y}{2}\right)} = 10$, then the value of $x + y$ is :
- (A) 1 (B) 0.6 (C) -0.8 (D) 0.5
11. If $(6, k)$ is a solution of the equation $3x + y - 22 = 0$, then the value of k is :
- (A) -4 (B) 4 (C) 3 (D) -3
12. If $3x - 5y = 1$, $\frac{2x}{x - y} = 4$, then the value of $(x + y)$ is :
- (A) 3 (B) -3 (C) $\frac{1}{3}$ (D) $-\frac{1}{3}$
13. If $3x + 2y = 13$ and $3x - 2y = 5$, then the value of :
- (A) 5 (B) 3 (C) 7 (D) 11
14. If the pair of equations $2x + 3y = 5$ and $5x + \frac{15}{2}y = k$ represent two coincident lines, then the value of k is :
- (A) $\frac{-25}{2}$ (B) -5 (C) $\frac{25}{2}$ (D) $\frac{-5}{2}$
15. Rs. 4,900 were divided among 150 children. If each girl gets Rs. 50 and a boy gets Rs. 25, then the number of boys is :
- (A) 100 (B) 102 (C) 104 (D) 105



Task-7: Remedial Worksheet

Topic	Pair of linear equations in two variables
Nature of task	Need Based
Content Coverage	<ul style="list-style-type: none"> • Conditions for consistency / inconsistency • Graphs of pair of linear equations in 2 variables
Learning Objectives	<ul style="list-style-type: none"> • To practice question based on conditions for consistency / inconsistency • To practice questions based on graphs
Task	Remedial Worksheet
Duration	Individual based
Criteria for assessment	This worksheet is used as a support for assessment material for students, so there is no need for allotting marks.
Follow up	Similar questions for practice can be given to students.

1. Consider the lines represented by the equations
- $$a_1x + b_1y + c_1 = 0$$
- $$a_2x + b_2y + c_2 = 0$$

Remember :

- i. Lines will intersect if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
- ii. Lines will coincide if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$
- iii. Lines will be parallel if $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

- Q.** Write equation of a line parallel to the line whose equation is $2x + 3y = 7$

Sol. Lines are parallel if $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Apply this condition on given equation.

Required equation of line can be

$$4x + 6y = 17$$

Observe

$$\frac{2}{4} = \frac{3}{6} \neq \frac{7}{17}$$



Write 3 more equations

(a)

(b)

(c)

Q. Write equation of a line intersecting with the line whose equation is $2x + 3y = 7$

Sol. Lines are parallel if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

Apply this condition on given equation.

Required equation of line can be

$$3x + 4y = 7$$

Observe

$$\frac{2}{3} \neq \frac{3}{4}$$

Write 3 more equations

(a)

(b)

(c)



Q. Write equation of a line coincident to the line whose equation is $2x + 3y = 7$

Sol. Lines are parallel if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Apply this condition on given equation.

Required equation of line can be

$$4x + 6y = 14$$

Observe

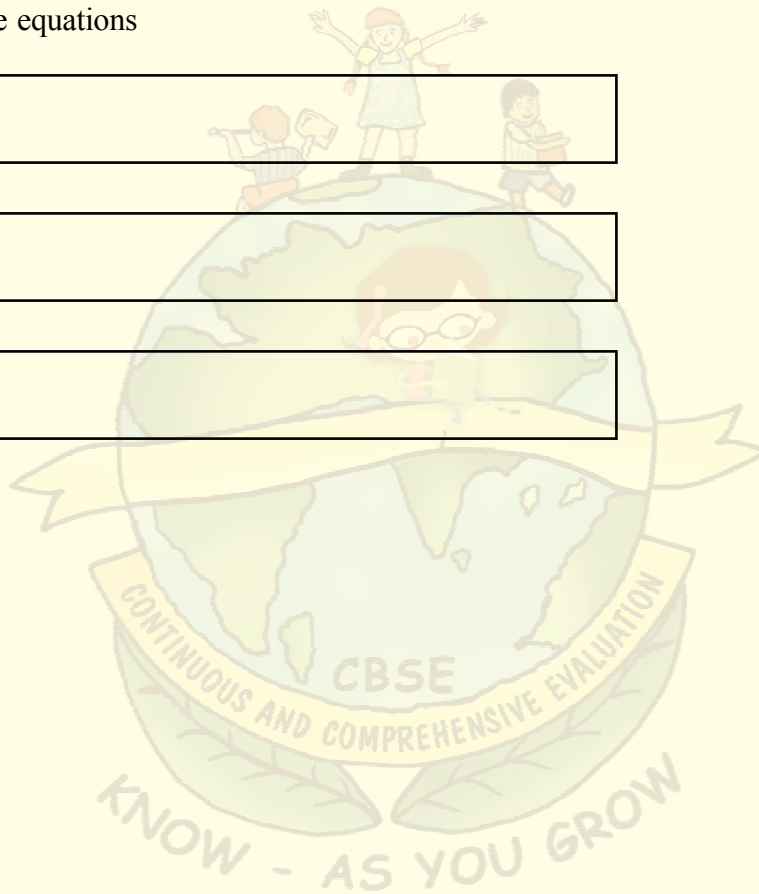
$$\frac{2}{4} = \frac{3}{6} \neq \frac{7}{14}$$

Write 3 more equations

(a)

(b)

(c)



Quadratic Equations

Learning Objectives :

- Recall and review quadratic polynomial
- To form a quadratic equation from a worded statement
- To write the standard form of a quadratic equation and note the coefficient of x^2 , x and constant term
- To learn to find solution of a quadratic equation by factorization method
- To learn to find solution of a quadratic equation by completing the square method
- To learn to find roots of a quadratic equation using quadratic formula
- To explore nature of roots

Task-1: Forming a quadratic equation

Topic	Quadratic equations
Nature of task	Warm up
Content Coverage	Introduction of quadratic equation
Learning Objectives	To recall quadratic polynomials To convert a word problem into a quadratic equation
Task	Forming a quadratic equation
Execution of task	To be done in the classroom. Teacher may ask students to write a quadratic polynomial, note its degree, observe coefficients of x^2 , x and constant term.
	Once it is done then worded statements may be written on the board which will result in the formation of a quadratic equation.
Duration	1 period
Criteria for assessment	It is a part of regular C.W. assessment.
Follow up	Discussion and explanation in classroom.



Task: Write the expression for following statements:

1. An organization decides to build a prayer hall having a carpet area of 300 square metres with its length one metre more than twice its breadth.
2. The product of two consecutive positive integers is 306.
3. Rita's mother is 26 years older than her. The product of their ages (in years) 3 years from now will be 360.

Task-2: Am I a quadratic equation?

Topic	Quadratic equations
Nature of task	Content Oriented
Content Coverage	Standard form of a quadratic equation
Learning Objectives	To write the standard form of a quadratic equation and note the coefficient of x^2 , x and constant term
Task	Am I a quadratic equation?
Execution of task	To be done in the classroom. Teacher may write some equations on board and ask students to check which one of them can be expressed as a quadratic equation in the standard form. Also, students would be asked to write coefficient of x^2 , x and constant term
Duration	1 period
Criteria for assessment	It is a part of regular C.W. assessment.
Follow up	Discussion and explanation in classroom.

Worksheet-1

Q.1. Which of the following are quadratic equations:

(i) $2x^3 - 3x + 5 = 0$

(v) $x^2 - 5x + 2$

(ii) $\sqrt{x} - x = 4$

(vi) $x^4 - x^2 + 2 = 0$

(iii) $x^3 + 3x^2 + 2 = 0$

(vii) $x^2 - \frac{1}{x} = 0$

(iv) $\frac{1}{x} + x = 5$

(viii) $(x + 1)(x + 2) = 5$

