MATHS

BOOKS - OSWAL PUBLICATION

PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

Example

1. For what value of p will the following pair of linear equations have infinitely many solutions.

$(p-3)x+3y=p$

$px+py=12$

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2. $\frac{x}{2} + \frac{2y}{3} = -1$ And $x - \frac{y}{3}$

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3. Solve the following system of equations :

$$\frac{21}{x} + \frac{47}{y} = 110$$
$$\frac{47}{x} = \frac{21}{y} = 162, x, y \neq 0$$

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Self Assessment 1 Multiple Choice Questions

1. The pair of lines represented by the equations $2x + y + 2 = 0$ and $4x + ky + 6 = 0$ will be parallel if value of k is

A. 2

B. -2

C. $\frac{5}{2}$

D. $\frac{1}{2}$

Answer:

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2. The lines $2x + y = 3$ and $4x + 2y = 6$ are

A. parallel

B. coincident

C. intersecting

D. none of these

Answer:

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3. If $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$, then the pair of linear equations has

A. one solution

B. two solutions

C. No solution

D. Infinitely many solutions

Answer: C

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Self Assessment 1 Fill In The Blanks

1. Pair of linear equation are $x - 2y = 3$ and $3x + y = 6$, then the nature of solution is .....

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2. The pair of linear equation $4x + py + 8 = 0$ and $2x + 2y + 2 = 0$ have unique solution, when value of p is _____

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3. The pair of linear equations $x + 2y = 3, 5x + ky + 7 = 0$ represents parallel lines, when the value of k is _____

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Self Assessment 1 Very Short Answer Type Questions

1. Find the value (s) of so that the pair of equations $x + 2y = 5$ and $3x + ky + 15 = 0$ has a unique solution

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2. Two lines are given to be paralle. The equation of one of the line is $4x + 3y = 14$, then find the equation of a second line.

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3. If am= bl, then find whether the pair of linear equations $ax + by = c$ and $lx + my = n$ has no solution, unique solution or infinitely many solutions

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Self Assessment 1 Short Answer Type Questions I

1. Find whether the lines represented by $2x + y = 3$ and $4x + 2y = 6$ are parallel, coincident or intersecting.

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2. Find whether the following pair of linear equations is consistent or inconsistent:

$3x + 2y = 8$ and $6x - 4y = 9$

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3. Given that linear equation $3x + 4y = 9$. Write another linear equation in these two variables such that the geometrical

represention of the pair so formed is

intersecting lines

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4. Given that linear equation $3x + 4y = 9$. Write another linear equation in these two variables such that the geometrical represention of the pair so formed is

coincident lines

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Self Assessment 1 Short Answer Type Questions Ii

1. Determine the values of $mandn$ so that the following system of linear equations have infinite number of solutions: .

$3x + (n-1)y - 2 = 0$

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2. Solve the pair of equations graphically:

$4x - y = 4$ and $3x + 2y = 14$

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3. Represent the following pair of linear equations graphically and hence comment on the condition of consistency of this pair

$x - 5y = 6, 2x - 10y = 12$

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Self Assessment 1 Long Answer Type Question I

1. For Uttarakhand flood victims two sections A and B of class X contributed Rs 1,500. If the contribution of X-A was Rs 100 less than that of X-B, find graphically the amounts contributed by both the sections.

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2. Solve graphically the pair of linear equations: $3x + 4y + 3 = 0$ and $3x + 4y - 21 = 0$. Find the co-ordinates of the vertices of the triangular region formed by these lines and X-axis. Also, calculate the area of this triangle.

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3. Solve the following pair of linear equations graphically: $x + 3y = 6$ and $2x - 3y = 12$. Also, shade the region bounded

by the line $2x - 3y = 12$ and both the co-ordinate axes.

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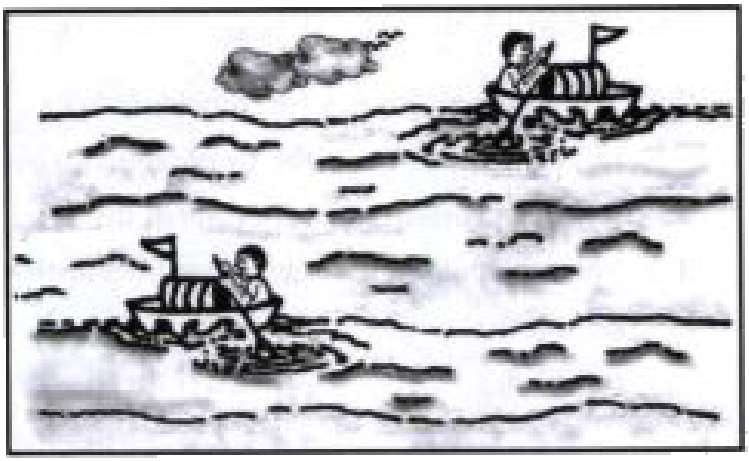
Self Assessment 1 Cose Study Based Questions



1.

A boat goes 30km upstream and 44km down stream in 10 hours. In 13 hours, it can go 40km upstream and 55km downstream. If the speed of the boat in still water be x km/h and speed of the stream be y km/h. Then.

Write the speed of the boat towards downstream.

A. $x \times ykm/h$

B. $(x+y)km/h$

C. $(x-y)km/h$

D. $\frac{x}{y}km/h$

Answer:

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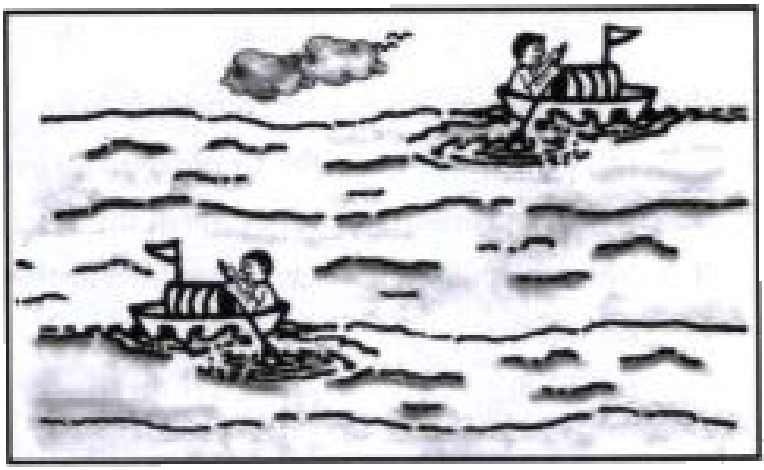
2.



A boat goes 30km upstream and 44km down stream in 10 hours. In 13 hours, it can go 40km upstream and 55km downstream. If the

speed of the boat in still water be x km/h and speed of the stream be y km/h. Then.

Find the speed d the boat towards upstream.

A. $\frac{x}{y} km/h$

B. $(x-y) km/h$

C. $x \times y km/h$

D. $(x+y) km/h$

Answer:

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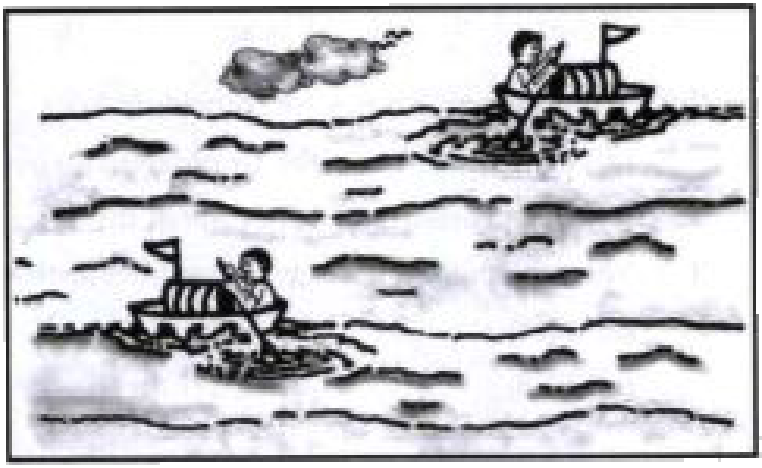
3. 

A boat goes 30km upstream and 44km down stream in 10 hours. In 13 hours, it can go 40km upstream and 55km downstream. If the speed of the boat in still water be x km/h and speed of the stream be y km/h. Then.

Time is equal to .....

A. distance $\times$ speed

B. $\frac{\text{speed}}{\text{distance}}$

C. $\frac{\text{distance}}{\text{speed}}$

D. none of these

Answer:

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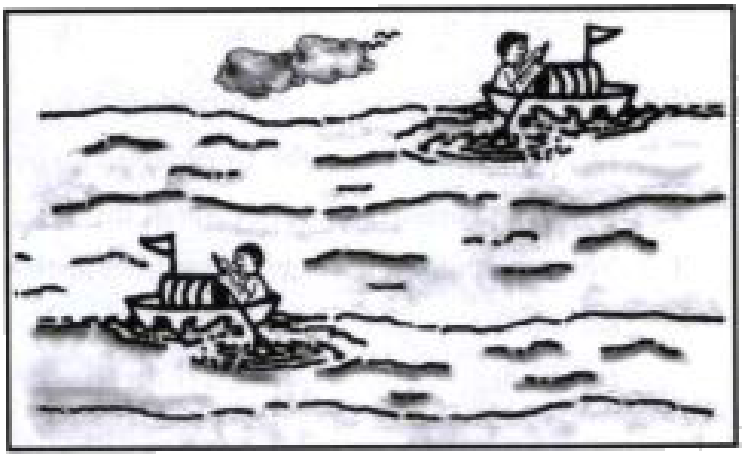
4.



A boat goes 30km upstream and 44km down stream in 10 hours. In 13 hours, it can go 40km upstream and 55km downstream. If the speed of the boat in still water be x km/h and speed of the stream be y km/h. Then.

Write the equation, when boat goes 30km upstream and 44km downstream in 10 hours.

A. $\frac{30}{x+y}+\frac{44}{x-y}=10$

B. $\frac{30}{x-y} - \frac{44}{x+y} = 10$

C. $\frac{30}{x+y} - \frac{44}{x-y} = 10$

D. $\frac{30}{x-y} + \frac{44}{x+y} = 10$

Answer:

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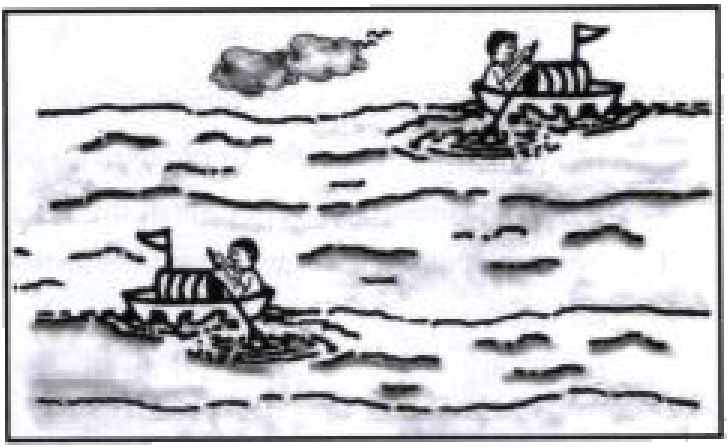
5.



A boat goes 30km upstream and 44km down stream in 10 hours. In 13 hours, it can go 40km upstream and 55km downstream. If the speed of the boat in still water be x km/h and speed of the stream

be y km/h. Then.

Write the equation when boat goes 40km upstream and 55km downstream in 13 hours.

A. $\frac{40}{x-y}+\frac{55}{x+y}=13$

B. $\frac{40}{x-y}-\frac{55}{x+y}=13$

C. $\frac{40}{x+y}+\frac{55}{x-y}=13$

D. $\frac{40}{x+y}-\frac{55}{x-y}=13$

Answer:

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6.

Akhila went to a fair in her village. She wanted to enjoy rides on the Giant wheel and play Hoopla (a game in which you throw a ring on the items kept in a stall, and if the ring covers any object completely, you get it) The number of times she played Hoopla is half the number of rides she had on the Giant wheel. The cost of each ride is Rs 3 and the cost of each game of Hoopla is Rs 4. She spent Rs 20 on both the game.

Write the two equations from the given information.

A. $x - 2y = 0 \text{ and } 3x + 4y = 20$

B. $2x - y = 0$ and $3x + 4y = 20$

C. $x + 2y = 0$ and $3x + 4y = 20$

D. $2x + y = 0$ and $3x + 4y = 20$

Answer:

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7. 

Akhila went to a fair in her village. She wanted to enjoy rides on the Giant wheel and play Hoopla (a game in which you throw a ring on the items kept in a stall, and if the ring covers any object

completely, you get it) The number of times she played Hoopla is half the number of rides she had on the Giant wheel. The cost of each ride is Rs 3 and the cost of each game of Hoopla is Rs 4. She spent Rs 20 on both the game.

Find the number of rides that Akhila had on the Giant wheel.

A. 2

B. 4

C. 3

D. 5

Answer:

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8. 

Akhila went to a fair in her village. She wanted to enjoy rides on the Giant wheel and play Hoopla (a game in which you throw a ring on the items kept in a stall, and if the ring covers any object completely, you get it) The number of times she played Hoopla is half the number of rides she had on the Giant wheel. The cost of each ride is Rs 3 and the cost of each game of Hoopla is Rs 4. She spent Rs 20 on both the game.

Find the number of times Akhila played Hoopla.

A. 1

B. 3

C. 4

D. 2

Answer:

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9.

Akhila went to a fair in her village. She wanted to enjoy rides on the Giant wheel and play Hoopla (a game in which you throw a ring on the items kept in a stall, and if the ring covers any object completely, you get it) The number of times she played Hoopla is

half the number of rides she had on the Giant wheel. The cost of each ride is Rs 3 and the cost of each game of Hoopla is Rs 4. She spent Rs 20 on both the game.

Find the amount that she spent on playing Hoopla

A. Rs 8

B. Rs 16

C. Rs 12

D. Rs 18

Answer:

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10. 

Akhila went to a fair in her village. She wanted to enjoy rides on the Giant wheel and play Hoopla (a game in which you throw a ring on the items kept in a stall, and if the ring covers any object completely, you get it) The number of times she played Hoopla is half the number of rides she had on the Giant wheel. The cost of each ride is Rs 3 and the cost of each game of Hoopla is Rs 4. She spent Rs 20 on both the game.

Find the amount that she spent on ride of Giant wheel.

A. Rs 8

B. Rs 16

C. Rs 12

D. Rs 10

Answer:

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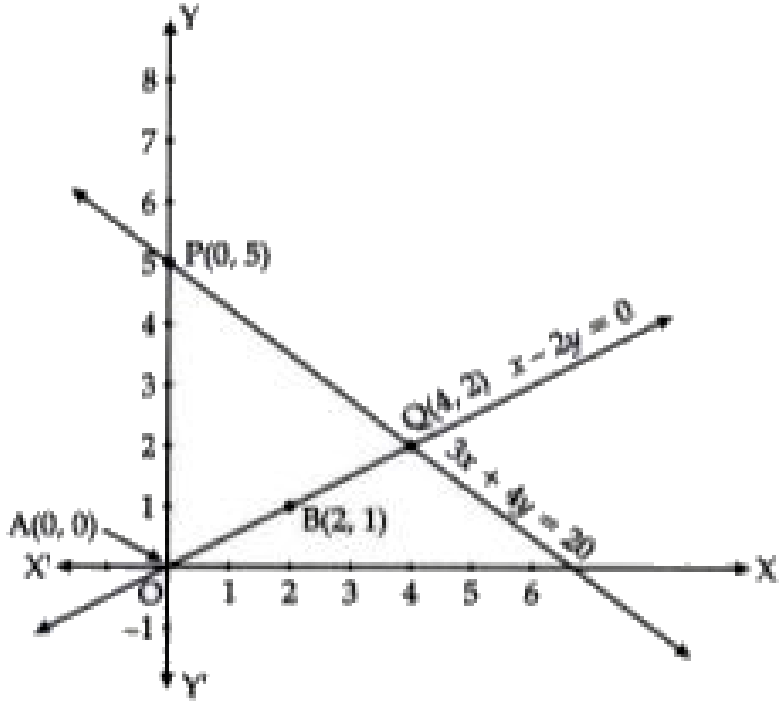
11.



Read the graph carefully:

What can you say about These lines, these line are .....

A. Intersecting lines

B. Coincident line

C. Parallel lines

D. none of these

Answer:

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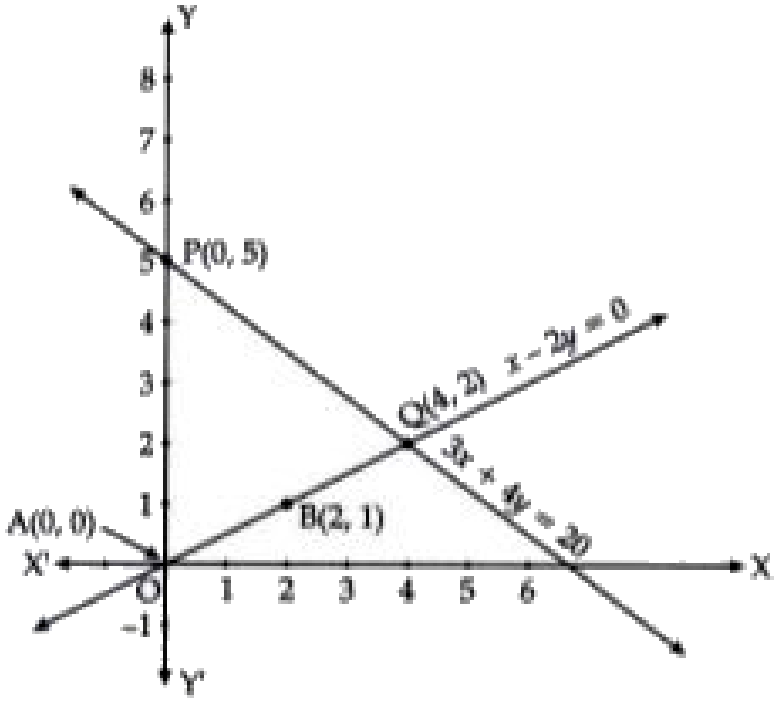
12. 

Read the graph carefully:

Write the algebraic condition, when two lines are intersecting lines.

A. $\frac{a_1}{a_2} = \frac{b_1}{b_2}$

B. $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

C. $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

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

Answer: B

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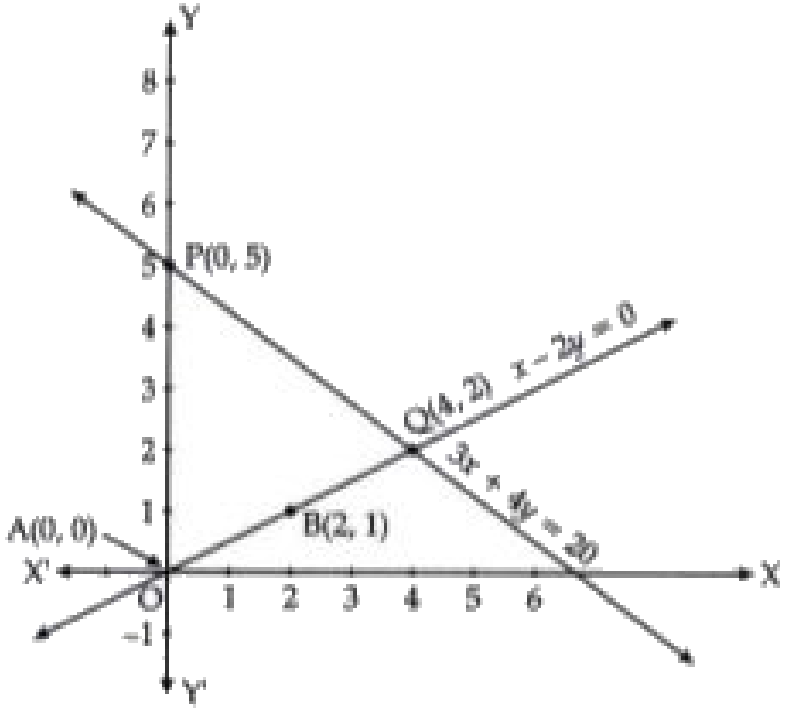
13.



Read the graph carefully:

Write the algebraic condition when two lines are parallel

A. $\frac{a_1}{a_2} = \frac{b_1}{b_2}$

B. $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

C. $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

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

Answer: D

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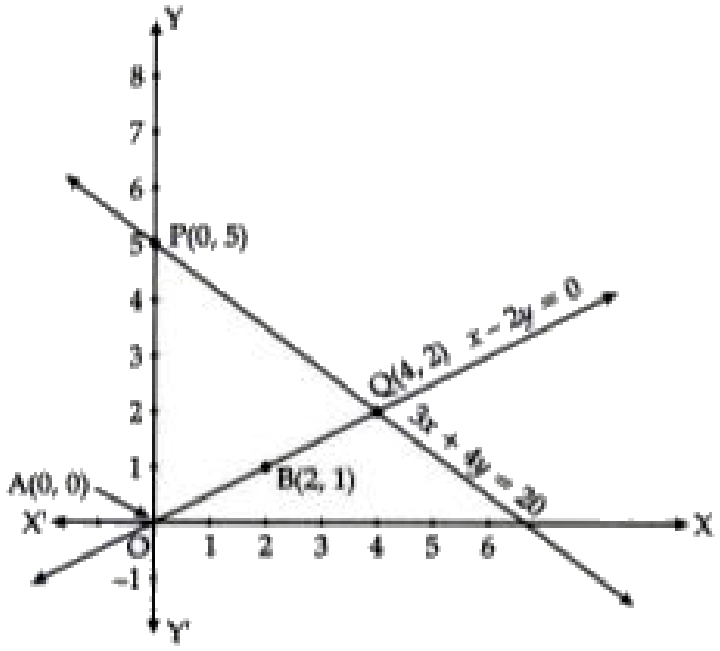

14.

Read the graph carefully:

Write the consistency for coincident lines

A. Consistent

B. Dependent consistent

C. In consistent

D. none of these

Answer:

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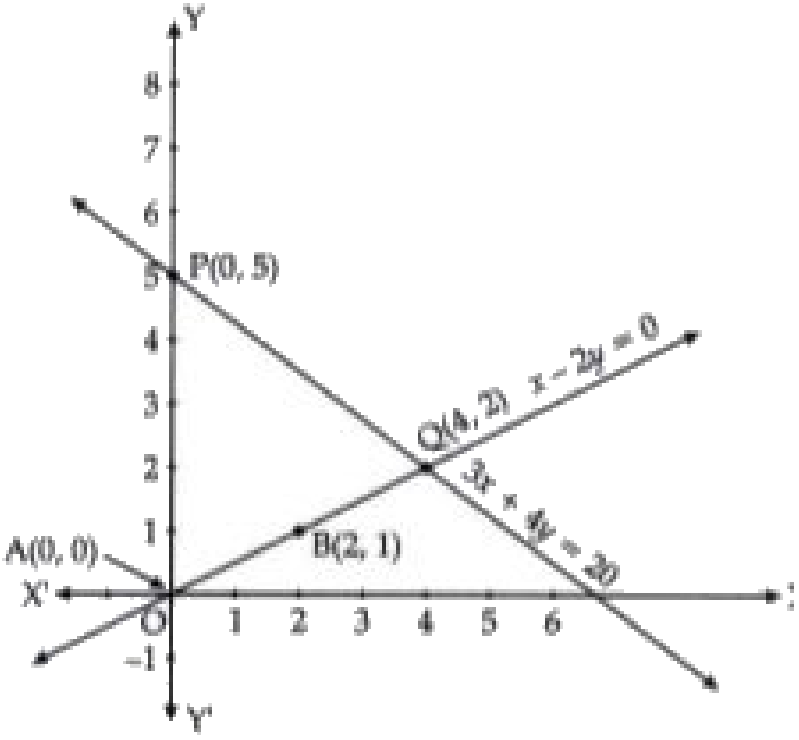

15.

Read the graph carefully:

Write the point where given two lines are intersect

A. (2,4)

B. (3,2)

C. (2,3)

D. (4,2)

Answer:

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Self Assessment 2 Multiple Choice Questions

1. If x = a and y = b is the solution of the equations x - y =2 and x + y = 4 , then the values of a and b are, respectively

A. a=3, b=1

B. a=1, b=3

C. $a = -3, b = -1$

D. $a = -3, b = 1$

Answer:

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2. Solution of pair of linear equations $x + 2y = 2$ and $x - 3y = 7$ is

A. $x = 4, y = 1$

B. $x = -4, y = 1$

C. $x = 4, y = -1$

D. $x = -4, y = -1$

Answer:

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

A. 40 and 48

B. 30a nd 35

C. 40 and 60

D. 50 and 60

Answer:

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Self Assessment 2 Fill In Blanks

1. On solving pair of linear equations $2x + y = 23$ and $4x - y = 19$, value of y will be .....

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2. If the solution of pair of linear equations $2x - 3y = 13$ and $7x - 2y = 20$ is $x = 2$ and $y = -3$, then the value of m for which $y = mx + 7$ is _____

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3. The solution of system of equations $x + y = 8, 2x - 3y = 1$ is _____and _____

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Self Assessment 2 Very Short Answer Type Question

1. Sum of the ages of a father and the son is 40 years. If father's age is three times that of his son, then find their respective ages.

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2. The angle of a triangle are x, y and 40. The difference between the two angles x and y is 30. Find the value of x and y.

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3. The sum of the digits of a two-digit number is 9. If 27 is added to it, the digit of the number get reversed. Find the numbers

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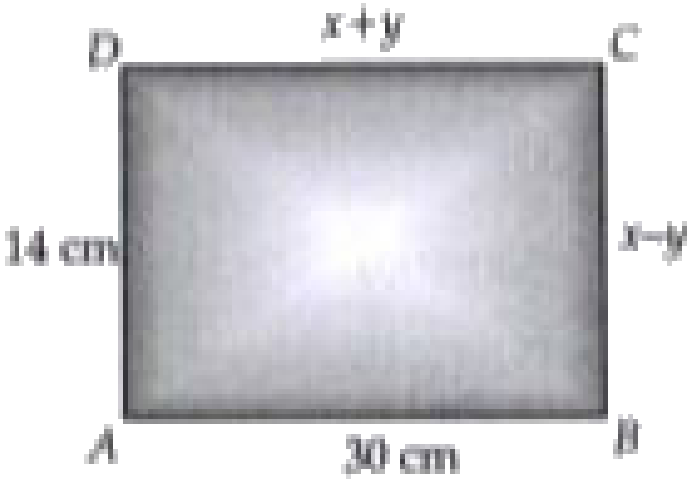
Self Assessment 2 Short Answer Type Questions I

1. In Fig, ABCD is a rectangle. Find the values of x and y.



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2. Solve the following pair of linear equations by substitution method:

$3x + 2y - 7 = 0$ and $4x + y - 6 = 0$

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3. The incomes ratio of two persons A and B are in the ratio $8:7$ and the ratio of their expenditures is $19:16$. If their saving are Rs 2550 per month, then their monthly incomes.

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Self Assessment 2 Short Answer Type Questions Ii

1. Raghav scored 70 marks in a test, getting 4 marks for each right answer the losing 1 marks for each wrong answer. By mistake, examinee awarded 5 marks for each correct answer and deducted 2 marks been for each wrong answer, then Raghav would have scored 80 marks. How many questions were there in the test?

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2. A part of monthly hostel charge is fixed and the remaining depends on the number of days one has taken food in the mess. When Swati takes food for 20 days, she has to pay Rs 3,000 as hostel charges whereas Mansi who takes food for 25 days has to pay Rs 3,500 as hostel charges. Find the fixed charges and the cost of food per day.

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3. Solve for x and y: $\frac{x}{2} + \frac{2y}{3} = -1$ and $x - \frac{y}{3} = 3$

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Self Assessment 2 Long Answer Type Questions

1. The area of a rectangle gets reduced by a 9 square units, if its length is reduced by 5 units and the breadth is increased by 3 units. The area is increased by 67 sqaure units if length is increased by 3 units and breadth is increased by 2 units. Find the perimeter of the rectangle.

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2. 4 chairs and 3 tables cost Rs 2100 and 5 chairs and 2 tables cost Rs 1750. Find the cost of a chair and a table separately.

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3. If 2 is subtracted from the numerator and 1 is added to the denominator, a fraction becomes $\frac{1}{2}$, but when 4 is added to the

numerator and 3 is subtracted from the denominator, it becomes $\frac{3}{2}$. Find the fraction.

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Ncert Corner Exercise 3 1

1. Aftab tells his daughter, "Seven years ago, I was seven times as old as you were then. Also, three years from now, I shall be three times as old as you will be." (Isn't this interesting?) Represent this situation algebraically and graphically.

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2. The coach of a cricket team buys 3 bats and 6 balls for Rs 3,900. Later, she buys another bat and 3 more ball of the same kind for Rs 1,300. Represent this situation algebraically and geometrically.

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3. The cost of 2kg of apples and 1 kg of grapes on a day was found to be Rs 160. After a month, the cost of 4 kg of apples and 2 kg of grapes is Rs 300. Represent the situation algebraically and geometrically.

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Ncert Corner Exercise 3 2

1. Form the pair of linear equations in the following problems, and find their solutions graphically.

10 students of Class X took part in a Mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.

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2. Form the pair of linear equations in the following problems, and find their solutions graphically.

5 pencils and 7 pents together cost Rs 50, whereas 7 pencils and 5 pens together cost Rs 46. Find the cost of one pencil and that of one pen.

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3. On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincident:

$5x - 4y + 8 = 0$

$7x + 6y - 9 = 0$

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4. On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincident:

$9x + 3y + 12 = 0$

$18x + 6y + 24 = 0$

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5. On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincident:

$6x - 3y + 10 = 0$

$2x - y + 9 = 0$

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6. 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 are consistent, or inconsistent.

$3x + 2y = 5, 2x - 3y = 7$

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7. 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 are consistent, or inconsistent.

$2x - 3y = 8, 4x - 6y = 9$

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8. 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 are consistent, or inconsistent.

$\frac{3}{2}x + \frac{5}{3}y = 7, 9x - 10y = 14$

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9. 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 are consistent, or inconsistent.

$5x - 3y = 11, \ -10x + 6y = \ -22$

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10. 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 are consistent, or inconsistent.

$\frac{4}{3}x + 2y = 8, 2x + 3y = 12$

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11. Which of the following pairs of linear equations are consistent/inconsistent? If consistent, obtain the solution graphically:

$x + y = 5, 2x + 2y = 10$

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12. Which of the following pairs of linear equations are consistent/inconsistent? If consistent, obtain the solution graphically:

$x - y = 8, 3x - 3y = 16$

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13. Which of the following pairs of linear equations are consistent/inconsistent? If consistent, obtain the solution graphically:

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

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14. Which of the following pairs of linear equations are consistent/inconsistent? If consistent, obtain the solution graphically:

$2x - 2y - 2 = 0, 4x - 4y - 5 = 0$

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15. Half the perimeter of a rectangular garden, whose length is 4 m more than its width, is 36 m. Find the dimensions of the garden.

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16. Given the linear equation $2x + 3y - 8 = 0$, write another linear equation in two variables such that the geometrical representation of the pair so formed is (i) intersecting lines (ii) Parallel lines (iii) coincident lines

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17. Given the linear equation $2x + 3y - 8 = 0$, write another linear equation in two variables such that the geometrical representation of the pair so formed is (i) intersecting lines (ii) Parallel lines (iii) coincident lines

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18. Given the linear equation $2x + 3y - 8 = 0$, write another linear equation in two variables such that the geometrical representation of the pair so formed is

coincident lines

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19. Draw the graphs of the equations $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Determine the co-ordinates of the vertices of the triangle formed by these lines and the x-axis, and shade the triangular region.

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Ncert Corner Exercise 3 3

1. Solve the following pair of linear equations by the substitution method:

$x + y = 14$

$x - y = 4$

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2. Solve the following pair of linear equations by the substitution method:

$s - t = 3$

$\frac{s}{3} + \frac{t}{2} = 6$

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3. Solve the following pair of linear equations by the substitution method:

$3x - y = 3$

$9x - 3y = 9$

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4. Solve the following pair of linear equations by the substitution method:

$0.2x + 0.3y = 1.3$

$0.4x + 0.5y = 2.3$

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5. Solve the following pair of linear equations by the substitution method:

$\sqrt{2}x + \sqrt{3}y = 0$

$\sqrt{3}x - \sqrt{8}y = 0$

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6. Solve the following pair of linear equations by the substitution method:

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

$\frac{x}{3} + \frac{y}{2} = \frac{13}{6}$

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7. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of 'm' for which y= mx+ 3.

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8. Form the pair of linear equations for the following problems and find their solution by substitution method.

The difference between two numbers is 26 and one number is three times the other. Find them.

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9. The larger of two supplementary angles exceeds the smaller by 18 degrees. Find them.

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10. The coach of a cricket team buys 7 bats and 6 balls for Rs 3800. Later, he buys 3 bats and 5 balls for Rs 1750. Find the cost of each bat and each ball.

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11. vi6.1_34

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12. Form the pair of linear equations for the following problems and find their solution by substitution method.

A fraction becomes $\frac{9}{11}$, if 2 is added to both the numerator and the denominator. If, 3 is added to both the numerator and the denominator it becomes $\frac{5}{6}$. Find the fraction.

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13. 20. Five years hence, the age of Jacob will be three times that of his son. Five years ago, ag was years Jacob's seven times that of his son. What are their present ages?

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Ncert Corner Exercise 3 4

1. Solve the following pair of linear equations by elimination method :

$x + y = 5$ and $2x - 3y = 4$.

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2. Solve the following pai of linear equation by elimination methods :

$3x + 4y = 10$ and $2x - 2y = 2.$

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3. Solve the following pair of linear equations $3x - 5y = 4$ and $2y + 7 = 9x$

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4. Solve the following pair of linear equations.

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

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5. Form the pair of linear equations in the following problems, and find their solutions (if they exist) by the elimination method:(i) 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 on

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6. Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu?

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7. 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.

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8. Meena went to a bank to withdraw Rs.2,000. She asked the cashier to give her Rs.50 and Rs.100 notes only. Meena got 25 notes in all. Find how many notes of Rs.50 and Rs.100 she received.

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9. A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid Rs 27 for a book kept for seven days, while Susy paid Rs 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.

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Ncert Corner Exercise 3 5

1. Which of the following pairs of linear equations has unique solution, no solution, or infinitely many solutions. In case there is a unique solution, find it by using cross multiplication method. `(i)\ \ \ \ x 3y 3=0;\ \ 3x 9y 2=0(i i)\ \ \ 2x+y=5;\

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2. Is the pair of linear equations $2x + y = 5$ and $3x + 2y = 8$ has unique solution ? In case there is a unique solution,find it by using cross multiplication method.

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3. In the following system of equations determine whether it has unique solution, no solution or infinitely many solutions. In case there is a unique solution, find it: $3x - 5y = 20, \quad 6x - 10y = 40$

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4. Which of the following pairs of linear equations has unique solution, no solution, or infinitely many solutions. In case there is a unique solution, find it by using cross multiplication method.

$x - 3y - 7 = 0$

$3x - 3y - 15 = 0$

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5. (i) For which values of a and b does the following pair of linear equations have an infinite number of solutions?

2x + 3y = 7

(a - b)x + (a + b)y = 3a + b - 2

(ii) 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

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6. For which value of k will the following pair of linear equations have no solutions?

$3x + y = 1$

$(2k - 1)x + (k - 1)y = 2k + 1$

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7. Solve the following pair of linear equations by the substitution and crossmultiplication methods:$8x + 5y = 9 3x + 2y = 4$

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8. Form the pair of linear equations in the following problems and find their solutions (if they exist) by any algebraic method :(i) A part of monthly hostel charges is fixed and the remaining depends on the number of days one has taken food in th

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9. 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.

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10. Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for

each incorrect answer, then Yash would have scored 50 marks. How many questions were there in the test?

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11. Places A and B are 100 km apart on a highway. One car starts from A and another from b at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars

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12. The area of a rectangle gets reduced by 9 square units if its length is reduced by 5 units and breadth is increased by 3 units. If we increase the length by 3 units and the breadth by 2 units, the

area increases by 67 squ units. Find the dimensions of the rectangle.

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Ncert Corner Exercise 3 6

1. Solve the following pairs of equations by reducing them to a pair of linear equations:

$$\frac{1}{2x} + \frac{1}{3y} = 2$$
$$\frac{1}{3x} + \frac{1}{2y} = \frac{13}{6}$$

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2. Solve the following pairs of equations by reducing them to a pair of linear equations:

$$\frac{2}{\sqrt{x}} + \frac{3}{\sqrt{y}} = 2$$
$$\frac{4}{\sqrt{x}} - \frac{9}{\sqrt{y}} = -1$$

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3. Solve the following system of equations:

$$\frac{4}{x} + 3y = 14, \quad \frac{3}{x} - 4y = 23$$

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4. Solve the following pair of equations by reducing them to a pair of linear equations: $\frac{5}{x-1} + \frac{1}{y-2} = 2\frac{6}{x-1} - \frac{3}{y-2} = 1$

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5. Slve the following pairs of equations by reducting them to a pair of linear equations:

(i) $\frac{7x-2y}{xy}=5$

$\frac{8x+7y}{xy}=15$

(ii) $\frac{1}{3x+y}+\frac{1}{3x-y}=\frac{3}{4}$

$\frac{1}{2(3x+y)}-\frac{1}{2(3x-y)}=\frac{-1}{8}$

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6. $6x+3y=6xy;\ 2x+4y=5xy$

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7. Solve the simultaneous equations.

$\frac{10}{x+y}=\frac{2}{x-y}=4,\ \frac{15}{x+y}-\frac{5}{x-y}=-2$

Watch Video Solution

8. $\frac{1}{3x+y}+\frac{1}{3x-y}=\frac{3}{4}, \frac{1}{2(3x+y)}-\frac{1}{2(3x-y)}=-\frac{1}{8}$

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9. Formulate the following problems as a pair of equations, and hence find their solutions:

Ritu can row downstream 20 km in 2 hours, and upstream 4km in 2 hours. Find her speed of rowing in still water and the speed of the current.

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10. Formulate the following problems as a pair of equations, and hence find their solutions:

2 women and 5 men can together finish an embroidery work in 4

days, while 3 women and 6 men can finish it in 3 days. Find the time taken by 1 women alone to finish the work, and also that taken by 1 man alone.

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11. Formulate the following problems as a pair of equations, and hence find their solutions:

Roohi travels 300km to her home partly by train and partly by bus. She taken 4 hours if she travels 60km by train and the remaining by bus. If she travels 100km by train and the remaining by bus, she takes 10 minutes longer. Find the speed of the train and the bus separately.

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Ncert Corner Exercise 3 7

1. The ages of two friends Ani and Biju differ by 3 years. Ani's father Dharam is twice as old as Ani and Biju is twice as old as his sister Cathy. The ages of Cathy and Dharam differ by 30 years. Find the ages of Ani and Biju.

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2. One says, "Give me a hundred, friend I shall then become twice as rich as you". The other replies, "If you give me ten, I shall be six times as rich as you". Tell me what is the amount of their (respective) capital?

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3. A train covered a certain distance at a uniform speed. If the train would have been 10 km/h faster, it would have taken 2 hours less

than the scheduled time. And, if the train were slower by 10km/h, it would have taken 3 hours more than the scheduled time. Find the distance covered by the train.

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4. The students of a class are made to stand in rows. If 3 students are extra in a row, there would be 1 row less. If 3 students are less in a row, there would be 2 rows more. Find the number of students in the class.

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5. In a ΔABC, $\angle C = 3\angle B = 2(\angle A + \angle B)$ find the three angles.

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6. draw the graphs of the equations $5x - y = 5$ and $3x - y = 3$ Determine the coordinates of the vertices of the triangle formed by these lines and the y axis.

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7. Solve the following pair of linear equations :

$px + qy = p - q$

$qx - py = p + q$

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8. Solve: $ax + by = c, \quad bx + ay = 1 + c$

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9. Solve the following system of equations by method of cross-multiplication: $\frac{x}{a} = \frac{y}{b}, \quad ax + by = a^2 + b^2$

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10. Solve the following system of linear equations. :

$(a - b)x + (a + b)y = a^2 - 2ab - b^2$,

$(a + b)(x + y) = a^2 + b^2.$

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11. Solve the following pair of linear equations :

$152x - 378y = -74$

$-378x + 152y = -604$

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12. ABCD is a cyclic quadrilateral (see Figure). Find the angles of the cyclic quadrilateral.

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Ncert Exemplar Exercise 3 1

1. Graphically, the pair of equations

$6x - 3y + 10 = 0$

$2x - y + 9 = 0$

represents two lines which are

A. intersecting at exactly one point

B. intersecting at exactly two point

C. coincident

D. parallel

Answer: D

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2. The pair of 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: D

Watch Video Solution

3. If a pair of linear equations is consistent, then the lines will be

A. parallel

B. always coincident

C. intersecting or coincident

D. always intersecting

Answer: C

Watch Video Solution

4. The pair of equations $y = 0$ and $y = -7$ has

A. one solution

B. two solutions

C. infinitely many solutions

D. no solution

Answer: D

Watch Video Solution

5. The pair of equations $x = a$ and $y = b$ graphically represents lines which are

A. parallel

B. intersecting at (b,a)

C. coincident

D. intersecting at (a,b)

Answer: D

Watch Video Solution

6. For what value of k, do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines ?

A. $\frac{1}{2}$

B. $\frac{-1}{2}$

C. 2

D. -2

Answer: C

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7. If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of k is

A. $\frac{-5}{4}$

B. $\frac{2}{5}$

C. $\frac{15}{4}$

D. $\frac{3}{2}$

Answer: C

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8. The value of c for which the pair of equations $cx - y = 2$ and $6x - 2y = 3$ will have infinitely many solutions is

A. 3

B. -3

C. -12

D. no value

Answer: D

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9. One equation of a pair of dependent linear equations is $-5x + 7y - 2 = 0$. The second equation can be

A. $10x + 14y + 4 = 0$

B. $-10x - 14y + 4 = 0$

C. $-10x + 14y + 4 = 0$

D. $10x - 14y = -4$

Answer: D

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10. A pair of linear equations which has a unique solution x = 2 and y = -3 is

A. $x + y = -1$

$2x - 3y = -5$

B. $2x + 5y = -11$

$4x + 10y = -22$

C. $2x - y = 1$

$3x + 2y = 0$

D. $x - 4y - 14 = 0$

$5x - y - 13 = 0$

Answer: A::B::D

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11. If x=a, y= b is the solution of the equation $x - y = 2$ and $x + y = 4$, then the values of a and b are, respectively

A. 3 and 5

B. 5 and 3

C. 3 and 1

D. -1 and 3

Answer: C

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12. Aruna has only Rs. 1 and Rs. 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is Rs. 75, then the number of Rs. 1 and Rs. 2 coins are, respectively

A. 35 and 15

B. 35 and 20

C. 15 and 35

D. 25 and 25

Answer: D

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13. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages (in year) of the son and the father are, respectively

A. 4 and 24

B. 5 and 30

C. 6 and 36

D. 3 and 24

Answer: C

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Ncert Exemplar Exercise 3 2

1. Do the following pair of linear equations have no solution? Justify your answer.

$2x + 4y = 3$

$12y + 6x = 6$

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2. Do the following pair of linear equations have no solution? Justify your answer.

$x = 2y, y = 2x$

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3. Do the following pair of linear equations have no solution? Justify your answer.

$3x + y - 3 = 0$

$2x + \frac{2}{3}y = 2$

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4. Do the following equations represent a pair of coincidnet lines? Justify your answer.

$3x + \frac{1}{7}y = 3, 7x + 3y = 7$

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5. Do the following equations represent a pair of coincidnet lines? Justify your answer.

$-2x - 3y = 1, 6y + 4x = -2$

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6. Do the following equations represent a pair of coincidnet lines? Justify your answer.

$\frac{x}{2} + y + \frac{2}{5} = 0$

$4x + 8y + \frac{5}{16} = 0$

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7. Are the following pair of linear equations consistent? Justify your answer.

$-3x - 4y = 12, 4y + 3x = 12$

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8. Are the following pair of linear equations consistent ? Justify your answer.

(i) $-3x - 4y = 12$ and $4y + 3x = 12$

(ii) $\frac{3}{5}x - y = \frac{1}{2}$ and $\frac{1}{5}x - 3y = \frac{1}{6}$

(iii) $2ax + by = a$ and $4ax + 2by - 2a = 0, a, b \neq 0$

(iv) $x + 3y = 11$ and $2(2x + 6y) = 22$

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9. Is the following of linear equations consistent ? Justify your answer.

$2ax + by = a, 4ax + 2by - 2a = 0, a, b, \neq 0$

Watch Video Solution

10. Are the following pair of linear equations consistent? Justify your answer.

$x + 3y = 11, 2(2x + 6y) = 22$

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11. For the pair of equations $\lambda x + 3y + 7 = 0$ and $2x + 6y - 14 = 0$. To have infinitely many solutions, the value of λ should be 1 . Is the statement true ?

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12. For all real values of c, the pair of equations $x - 2y = 8, 5x - 10y = c$ have a unique solution. Justify whether it is true or false

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13. The line represented by x = 7 is parallel to the X-axis, justify whether the statement is true or not.

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Ncert Exemplar Exercise 3 3

1. For which value(s) of λ, do the pair of linear equations $\lambda x + y = \lambda^2$ and $x + \lambda y = 1$ have no solution?

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2. For which value(s) of λ, do the pair of linear equations $\lambda x + y = \lambda^2$ and $x + \lambda y = 1$ have

infinitely many solutions?

Watch Video Solution

3. For which value(s) of λ, do the pair of linear equations $\lambda x + y = \lambda^2$ and $x + \lambda y = 1$ have

a unique solution?

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4. For which value (s) of k will the pair of equations

$kx + 3y = k - 3,$

$12x + ky = k$

has no solution ?

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5. For which values of a and b will the following pair of linear equations has infinitely many solutions ?

$x + 2y = 1$

$(a - b)x + (a + b)y = a + b - 2$

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6. Find the value(s) of p for the following pair of equations:

$3x - y - 5 = 0$ and $6x - 2y - p = 0$, if the lines represented by these equations are parallel.

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7. Find the value(s) of p for the following pair of equations:

$-x + py = 1$ and $px - y = 1$, if the pair of equations has no solution.

Watch Video Solution

8. Find the value(s) of p for the following pair of equations:

$-3x + 5y = 7$ and $2px - 3y = 1$, if the lines represented by these equations are intersecting at a unique point.

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9. Find the value(s) of p for the following pair of equations:

$2x + 3y - 5 = 0$ and $px - 6y - 8 = 0$, if the pair of equations has a unique solution.

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10. Find the value(s) of p and q for the following pair of equations:

$2x + 3y = 7$ and $2px + py = 28 - qy$, if the pair of equations have infinitely many solutions.

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11. Two straight paths are represented by the equations $x - 3y = 2$ and $-2x + 6y = 5$. Check whether the paths cross each other or not.

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12. Write a pair of linear equations which has the unique solution $x = -1, y = 3$. How many such pairs can you write?

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13. If $2x + y = 23$ and $4x - y = 19$, then find the values of $5y - 2x$ and $\frac{y}{x} - 2$.

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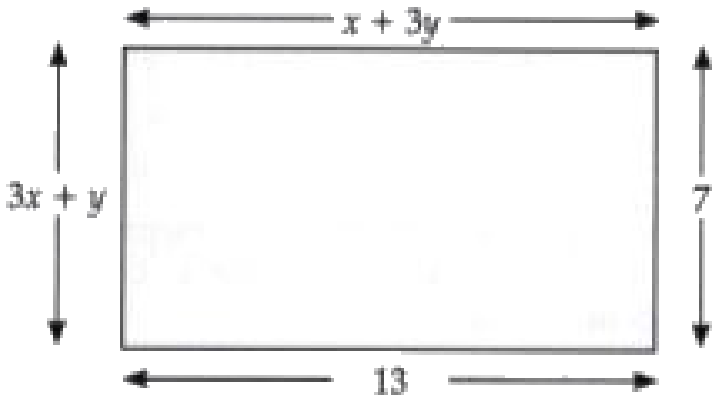
14. Find the values of x and y in the following rectangle.



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15. Solve the following pair of equations:

$x + y = 7$

$\frac{4}{2x - 5y} = 1, 2x - 5y \neq 0$

Watch Video Solution

16. Solve the following pair of equations:

$$\frac{x}{3}+\frac{y}{4}=4, \frac{5x}{6}-\frac{y}{8}=4$$

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17. Solve the following pair of equations:

$$4x+\frac{6}{y}=15, 6x-\frac{8}{y}=14, y\neq 0$$

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18. Solve for x and y:

$$\frac{1}{2x}-\frac{1}{y}=-1, \frac{1}{x}+\frac{1}{2y}=8(x\neq 0, y\neq 0)$$

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19. Solve the following pair of equations:

$43x + 67y = -24$

$67x + 43y = 24$

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20. Solve the following pair of equations:

$\frac{x}{a} + \frac{y}{b} = a + b, \frac{x}{a^2} + \frac{y}{b^2} = 2, a, b \neq 0$

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21. Solve the following pair of equations:

$\frac{2xy}{x+y} = \frac{3}{2}, \frac{xy}{2x-y} = \frac{-3}{10}, x + y \neq 0, 2x - y \neq 0$

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22. Find the solution of the pair of equations $\frac{x}{10}+\frac{y}{5}-1=0$ and $\frac{x}{8}+\frac{y}{6}=15$ and find λ, if $y=\lambda x+5$.

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23. By the graphical method, find whether the following pair of equations are consistent of not. If consistent, solve them.

(i)$3x+y+4=0, 6x-2y+4=0$

(ii) $x-2y=6, 3x-6y=0$

(iii) $x+y=3, 3x+3y=9$

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24. By the graphical method, find whether the following pair of equations are consistent of not. If consistent, solve them.

(i)$3x+y+4=0, 6x-2y+4=0$

(ii) $x - 2y = 6, 3x - 6y = 0$

(iii) $x + y = 3, 3x + 3y = 9$

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25. By the graphical method, find whether the following pair of equations are consistent of not. If consistent, solve them.

(i)$3x + y + 4 = 0, 6x - 2y + 4 = 0$

(ii) $x - 2y = 6, 3x - 6y = 0$

(iii) $x + y = 3, 3x + 3y = 9$

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26. Draw the graph of the pair of equations 2x+y=4 and 2x-y=4. Write the vertices of the triangle formed by these lines and the y-axis, find the area of this triangle?

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27. Write an equation of a line passing through the point representing solution of the pair of linear equations x+y=2 and 2x-y=1, How many such lines can we find?

Watch Video Solution

28. If (x+1) is a factor of $2x^3 + ax^2 + 2bx + 1$, then find the value of a and b given that 2a-3b=4.

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29. If the angles of a triangle are x, y and 40° and the difference between the two angles x and y is 30°. Then, find the value of x and y.

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30. Two years ago, Salim was thrice as old as his daughter and six years later, he will be four year older than twice her age. How old are they now?

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31. The age of the father is twice the sum of the ages of his two children. After 20 yr, his age will be equal to the sum of the ages of his children. Find the age of the father.

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

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33. There are some students in the two examination halls A and B. To make the number of students equal in each hall, 10 students are sent from A to B but, if 20 students are sent from B to A, the number of students in A becomes double the number of students in B, then find the number of students in the both halls.

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34. A shopkeeper gives books on rent for reading. She takes a fixed charge for the first two days and an additional charge for each day thereafter. Latika paid Rs. 22 for a book kept for six days, while Anand paid Rs. 16 for the book kept for four days. Find the fixed charges and the charge for each extra day.

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35. In a competitive examination, 1 mark is awarded for each correct answer while 1/2 mark is deducted for every wrong answer. Jayanti answered 120 questions and got 90 marks. How many questions did she answer correctly?

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36. The angles of a cyclic quadrilateral ABCD are $\angle A = (6x + 10)^\circ, \angle B = (5x)^\circ, \angle C = (x + y)^\circ$ and $\angle D = (3y - 10)^\circ$.

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Ncert Exemplar Exercise 3 4

1. Graphically, solve the following pair of equations

$2x+y=6$ and $2x-y+2=0$

Find the ratio of the areas of the two triangles formed by the lines representing these equations with the X-axis and the lines with the y-axis.

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2. Determine graphically, the vertices of the triangle formed by the lines

$y=x$, $3y=x$ and $x+y=8$

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3. Draw the graphs of the equations $x=3$, $x=5$ and $2x-y-4=0$. Also find the area of the quadrilateral formed by the lines and the X-axis.

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4. The cost of 4 pens and 4 pencils boxes is Rs. 100. Three times the cost of a pen is Rs. 15 more than the cost of a pencil box. Form the pair of linear equations for the above situation. Find the cost of a pen.

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5. Determine, algebraically, the vertices of the triangle formed by the lines

3x-y=3

2x-3y=2

and $x + 2y = 8$

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6. Ankita travels 14km to her home partly by rickshaw and partly by bus. She takes half an hour if she travels 2 km by rickshaw, and the remaining distance by bus. On the other hand, if she travel 4 km by rickshaw and the remaining distance by bus, she takes 9 minute longer. Find the speed of the rickshaw and of the bus.

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7. A person can row a boat at the rate of 5 km/hour in still water. He takes thrice as much time in going 40 km upstream as in going 40 km downstream. Find the speed of the stream.

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8. A ,motorboat can travel 30 km upstream and 28 km downstream in 7 h. It can travel 21 km upstream and return in 5 h. Find the

speed of the boat in still water and the speed of the stream.

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9. A two-digit number is obtained by either multiplying the sum of the digits by 8 and then subtracting 5 or by multiplying the difference of the digits by 16 and then adding 3. Find the number.

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10. A railway half ticket cost half the full fare but the reservation charges are the same on a half ticket as on a full ticket. One reserved first class ticket from the stations A to B costs Rs. 2530. Also, one reserved first class ticket and one reserved first class half ticket from stations A to B costs Rs. 3810. Find the full first class fare from stations A to B and also the reservation charges for a ticket.

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11. A shopkeeper sells a saree at 8% profit and a sweater at 10% discount, thereby, getting a sum Rs 1008. If she had sold the saree at 10% profit and the sweater at 8% discount, she would have got Rs 1028 then find the cost of the saree and the list price (price before discount) of the sweater.

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12. Susan invested certain amount of money in two schemes A and B, which offer interest at the rate of 8% per annum and 9% per annum, respectively. She received Rs 1,860 as annual interest. However, had she interchanged the amount of investments in the two schemes, she would have received Rs 20 more as annual interest. How much money did she invest in each scheme?

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13. Vijay had some bananas and he divided them into two lots A and B. He sold the first lot at the rate of RS. 2 for 3 bananas and the second lot at the rate of Rs 1 per banana and got a total of Rs. 400. If he had sold the first lot at the rate of Rs. 1 per banana and the second lot at the rate of Rs. for 5 bananas , his total collection would have been Rs 460. Find the total number of bananas he had.

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Board Corner Short Answer Type Questions

1. Find c if the system of equations $cx + 3y + (3 - c) = 0, 12x + cy - c = 0$ has infinitely many solutions?

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2. For what the value of k, the following pair of linear equations have infinitely many solutions :

$2x + 3y = 7$ and $(k+1)x + (2k-1)y = 4k+1$

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3. Find the value(s) of k so that the pair of equations $x + 2y = 5$ and $3x + ky + 15 = 0$ has a unique solution

Watch Video Solution

4. For what value of k, will the following pair of equations have infinitely many solutions:

$2x + 3y = 7$ and $(k+2)x - 3(1-k)y = 5k+1$

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Watch Video Solution

5. The larger of two supplementary angles exceed the smaller by 18°. Find the angles.

Watch Video Solution

6. Sumit is 3 times as old as his son. Five years later, he shall be two and half times as old as his son. How old is Sumit at present?

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7. A father's age is three times the sum of the ages of his two children. After 5 years his age will be two times the sum of their ages. Find the present age of the father.

Watch Video Solution

8. A fraction becomes $\frac{1}{3}$ when 2 is subtracted from the numerator and it becomes $\frac{1}{2}$ when 1 is subtracted from the denominator. Find the fraction.

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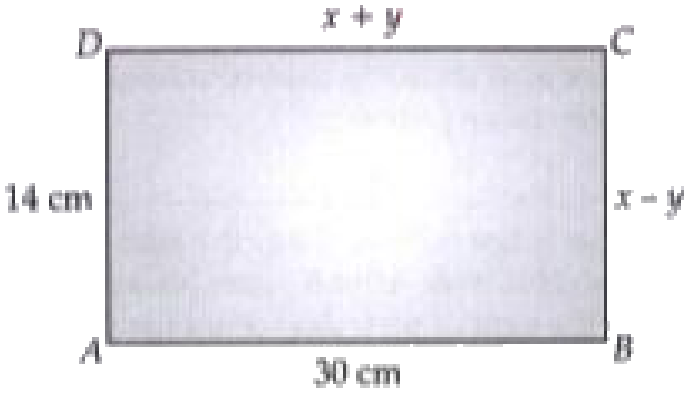
9. In Fig.ABCD is a rectangle. Find the values of x and y



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Board Corner Long Short Answer Type Questions

1. A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km downstream. Determine the speed of the stream and that of the boat in still water.

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Multiple Choice Questions

1. The value of x and y in $2x + 3y = 2$ and $x - 2y = 8$ are

A. $-4, 2$

B. $-4, -2$

C. $4, -2$

D. 4, 2

Answer: C

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2. The values of x and y in $2x + y + 1 = 0$ and $2x - 3y + 8 = 0$ are:

A. 1,2

B. $\frac{-11}{8}, \frac{7}{4}$

C. $\frac{11}{8}, \frac{7}{4}$

D. 2,3

Answer: B

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3. The perimeter of an isosceles triangle is 65cm and th eunequal side is thrice as large as each of the equal sides. The length of the sides are:

A. 13, 13,39

B. 39,39,26

C. 13, 26,26

D. 13,13,26

Answer: A

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4. The value of k for which the system of linear equations $x + 2y = 3, 5x + ky + 7 = 0$ is inconsistent is:

A. $-\frac{14}{3}$

B. $\frac{2}{5}$

C. 5

D. 10

Answer: D

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5. The value of k for which the system of equations $x + y - 4 = 0$ and $2x + ky = 3$, has no solutions, is

A. -2

B. $\neq 2$

C. 3

D. 2

Answer: D

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6. The pair of linear equations $2x + 3y = 4$ and $3x + 4y = 9$ has

A. infinitely many solutions

B. no solution

C. one unique solution

D. two solutions

Answer: C

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7. A system of simultaneous linear equations is said to be inconsistent, it it has:

A. one solution

B. two solution

C. no solution

D. infinite solutions

Answer: C

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8. If a pair of linear equations is inconsistent, then the lines will be:

A. coincident

B. parallel

C. intersecting

D. can't say

Answer: C

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9. The system of equations $3x + y - 4 = 0$ and $6x + 2y - 8 = 0$ has:

A. a unique solution x= 1, y=1

B. a unique solution x= 0, y=4

C. no solution

D. infinite solutions

Answer: D

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10. The value of k, for which the system of equations $3x - ky - 20 = 0$ and $6x - 10y + 40 = 0$ has no solution, is:

A. 10

B. 6

C. 5

D. 3

Answer: C

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11. If the pair of linear equations $2x + 3y = 11$ and $(m + n)x + (2m - n)y - 33 = 0$ has infinitely many solutions, then the values of m and n, are .....and..... respectively.

A. 5,1

B. 1,2

C. $-1, 5$

D. $1, \ -5$

Answer: A

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12. The sum of the digits of a two digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is.....

A. 36

B. 63

C. 27

D. 72

Answer: A

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13. The pair of equation $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ have:

A. a unique solution

B. exactly two solutions

C. infinitely many solutions

D. no solution

Answer: D

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14. If a pair of linear equation is consistent, then the lines will be

A. parallel

B. always coincident

C. intersecting or coincident

D. always intersecting

Answer: C

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Very Short Answer Type Questions

1. Find the values of x and y in $3x + 2y = 4$ and $2x - 3y = 7$

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2. Find the values of x and y in $2x - 5y + 4 = 0$ and $2x + y - 8 = 0$

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3. Given the linear equation $x - 2y - 6 = 0$, write another linear equation in these two variables, such that the geometrical representation of the pair so formed is:

coincident lines

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4. Given the linear equation $x - 2y - 6 = 0$, write another linear equation in these two variables, such that the geometrical representation of the pair so formed is:

intersecting lines

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5. A number consists of 2 digits. The sum of the digits is 12 and the units digital when divided by the tens digit gives the result as 3. Find the number.

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6. The cost of 2 kg apples and 1kg grapes was Rs 160. After a month, the cost of 4kg apples and 2kg grapes was Rs 300. Represent the situation algebraically

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7. Cost of 2 pens and 3 pencils together is Rs 40 and cost of 6 pens and 9 pencils together is Rs 130. Express above statement in the form of linear equations.

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8. Cost of a burger is Rs 20 more than the cost of juice of one glass of orange. If cost of one burger and one glass of orange juice is Rs 60. Find the cost of each.

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9. Solve for x and y: $mx - ny = m^2 + n^2$ and $x + y = 2m$

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10. Solve for x and y : $152x - 378y = -74$ and $-378x + 152y = -604$

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11. Determine the value of k, for which the given system of equations has infinitely many solutions:

$kx + 3y = k - 3$ and $12x + ky = k$

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12. Determine the value of k, for which the given system of equations has no solution:

$3x + y = 1$ and $(2k - 1)x + (k - 1)y = 2k + 1$

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13. For what value of k will the system of equations $x + 2y = 5$ and $3x + ky - 15 = 0$ has

a unique solution

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14. For what value of k will the system of equations $x + 2y = 5$ and $3x + ky - 15 = 0$ has infinite solutions?

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15. Determine the value of α and β for which the given system of equations has infinitely many solutions: $2x + 3y = 7$ and $2\alpha x + (\alpha + \beta)y = 28$

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16. For what value of k will the system of equations $(3k + 1)x + 3y - 2 = 0$ and $(k^2 + 1)x + (k - 2)y - 5 = 0$ has no solution ?

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17. For what value of k will the system of equations $4x + ky + 8 = 0$ and $2x + 2y + 2 = 0$ has a unique solution?

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18. For what value of α will the system of equations $\alpha x + 3y = \alpha - 3$ and $12x + \alpha y = \alpha$ has no solution ?

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Short Answer Type Questions

1. Solve for x and y

$ax + by - a + b = 0$ and $bx - ay - a - b = 0$

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2. Find the value (s) of k so that the pair of equations $x + 2y = 5$ and $3x + ky + 15 = 0$ has a unique solution

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3. Solve for x and y : $0.4x - 1.5y = 6.5$ and $0.3x + 0.2y = 0.9$

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4. Solve for x and y:

$(a - b)x + (a + b)y = a^2 - 2ab - b^2$ and $(a + b)(x + y) = a^2 + b^2$

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5. Determine the value of a and b for which the given system of equations has infinitely many solutions:

$(2a-1)x+3y-5=0$ and $3x+(b-1)y-2=0$

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6. Find the value of k for which the following pair of linear equations have infinitely many solutions.

$2x+3y=7, (k+1)x+(2k-1)y=4k+1$

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7. Determine the values of a and b for which the given system of equations has infinitely many solutions:

$2x+3y=7$ and $(a-b)x+(a+b)y=3a+b-1$

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8. Determine the value of a for which the given system of equations has infinitely many solutions:

$2x + 3y = 7$ and $(a - 1)x + (a + 2)y = 3a$

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9. Find c if the system of equations $cx + 3y + (3 - c) = 0, 12x + cy - c = 0$ has infinitely many solutions?

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10. Determine the value of k for which the given system of equations has infinitely many solutions:

$x + (k + 1)y = 5$ and $(k + 1)x + 9y = (8k - 1)$

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11. Solve for x and y:

$$\frac{bx}{a} - \frac{ay}{b} + a + b = 0 \text{ and } bx - ay + 2ab = 0$$

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12. Solve for x and y $\frac{x}{a} + \frac{y}{b} = 2$ and $ax - by = a^2 - b^2$

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13. For what value of k will the system of equations $kx + 3y = (2k + 1)$ and $2(k + 1)x + 9y = (7k + 1)$ has infinite solutions ?

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Long Answer Type Questions

1. Check graphically whether the pair of equations $3x - 2y + 2 = 0$ and $\frac{3}{2}x - y + 3 = 0$ is consistent. Also find the coordinates of the points where the graphs of the equations meet the Y-axis

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2. Solve the following system of linear equations graphically $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Calculate the area of the region bounded by these lines and the X-axis

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3. Draw the graph of the following pair of linear equations:

$x + 3y = 6$ and $2x - 3y = 12$

Find the ratio of the area of the two triangles formed by first line, x= 0, y= 0 and second line, x= 0, y= 0

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4. Draw graph of the following pair of linear equations:

$y = 2(x - 1)$

$4x + y = 4$

Also write the coordinate of the points where these lines meets X-axis and Y-axis

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Assertion And Reasoning Based Questions

1. Assertion: $x + y - 4 = 0$ and $2x + ky - 3 = 0$ has no solution if k=2

Reason: $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are consistent if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

A. Both the Assertion and the Reason and correct and the Reason is the correct explanation of the Assertion

B. Both the Assertion and the Reason and correct and the Reason is not the correct explanation of the Assertion

C. Assertion is true but the Reason is false

D. Assertion is false but the Reason is true

Answer: B

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2. Assertion: If the system of equations $2x + 3y = 7$ and $2ax + (a + b)y = 28$ has infinitely many solutions, then $2a - b = 0$

Reason: The system of equations $3x - 5y = 9$ and $6x - 10y = 8$ has a unique solution

A. Both the Assertion and the Reason and correct and the Reason is the correct explanation of the Assertion

B. Both the Assertion and the Reason and correct and the Reason is not the correct explanation of the Assertion

C. Assertion is true but the Reason is false

D. Assertion is false but the Reason is true

Answer: C

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Self Assessment

1. Given the linear equation $2x + 3y - 8 = 0$, write another equation in two variables such that the graphical representation of the pair so formed is

intersecting

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2. Given the linear equation $2x + 3y - 8 = 0$, write another equation in two variables such that the graphical representation of the pair so formed is

parallel

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3. Given the linear equation $2x + 3y - 8 = 0$, write another equation in two variables such that the graphical representation of the pair so formed is

coincident

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4. Solve for x and y: $\frac{x}{6} - \frac{y}{3} = \frac{x}{12} - \frac{2y}{3} = 4$

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5. Solve for x and y: $\frac{x}{a} + \frac{y}{b} = 2$ and $ax - by = a^2 - b^2$

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6. Find the values of x and y in $2x + 3y = 8$ and $x - 2y + 3 = 0$ are:

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7. The values of x and y in $2x - 5y + 4 = 0$ and $2x + y - 8 = 0$ are:

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8. Find the values of x and y in $2x + 3y = 2$ and $x - 2y = 8$

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9. Determine the value of k for which the given system of equations has infinitely many solutions:

$x + (k+1)y = 5$ and $(k+1)x + 9y = 8k - 1$

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10. Determine the value of k for which the given system of equations have no solution:

$3x - y - 5 = 0$ and $6x - 2y + k = 0$ where $k \neq 0$

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11. Determine the values of a and b for which the given system of equations have infinitely many solutions:

$2x - 3y = 7$ and $(a+b)x - (a+b-3)y = 4a + b$

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12. For what value of k, will the following pair of equations have infinitely many solutions:

$2x + 3y = 7$ and $(k + 2)x - 3(1 - k)y = 5k + 1$

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13. Solve the following linear equations algebraically:

$(a - b)x + (a + b)y = a^2 - 2ab - b^2$ and $(a + b)(x + y) = a^2 + b^2$

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14. For what value of k will the system of equations $2x + (k - 2)y = k$ and $6x + (2k - 1)y = 2k + 5$ has infinite solutions ?

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