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PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

IMPORTANT CONCEPTS

TAKE A LOOK:

- 1. EQUATION: The statement of an equality is called an equation.
- Linear equation in one variable: An equation of the form ax+b=0, where a, b are real numbers, (a≠0) is called a linear equation in one variable.
- 3. Linear equation in two variables: An equation of the form ax+by+c=0, where a,b,c are real numbers(a≠0,b≠0)is called a linear equation in two variables x and y.
- 4. Consistent system of linear equations: A system of two linear equations in two unknowns is said to be consistent if it has at least one solution.
- 5. Inconsistent system of linear equations: if a system has no solution, then it is called inconsistent. The system of a pair of linear equations

 $a_{1 \times b_{1} + b_{1} + c_{1} = 0}$ $a_{2 \times b_{2} + b_{2} + c_{2} = 0}$

- (i) has no solution. If $a_1/a_2 = b_1/b_2 \neq c_1/c_2$
- (ii) has an infinite number of solutions If $a_1/a_2 = b_1/b_2 = c_1/c_2$
- (iii) has exactly one solution. If $a_1/a_2 \neq b_1/b_2$

6. Algebraic methods:
(i)Method of substitution
(ii)Method of elimination by addition or subtraction
(iii)Method of cross multiplication

a_{1 X+}b_{1 y+}c_{1 =0} a_{2 X} b_{2 y+}c_{2 =0}

$$\chi_{=} b_{1}c_{2} \cdot b_{2}c_{1}/a_{1}b_{2} \cdot a_{2}b_{1}, y = c_{1}a_{2} \cdot c_{2}a_{1}/a_{1}b_{2} \cdot a_{2}b_{1}$$





- The pair 2x=3y-5 and 2y= 5x-4 of linear equations represents two lines which are
 (a) Parallel (b) coincident (c) intersecting (d) either parallel or coincident [Ans(c)]
- The pair x=p and y=q of the linear equations in two variables x and y graphically represents two lines which are

(a) Parallel (b) coincident (c) intersecting at(p,q) (d) intersecting at(q,p)

3. If the lines represented by the pair of linear equations 2x+5y=3 and (k+1)x +2(k+2)y=2k are coincident, then the value of k is

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

[Ans(b)]

[Ans(c)]

4. If the pair of linear equations (3k+1)x+3y-2=0 and (k²+1)x+(k-2)y-5=0 inconsistent, then The value of k is
(a) 1 (b) -1 (c) 2 (d)-2 [Ans(b)]

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5. If the pair of linear equations 2x+3y=11 and 2px+(p+q)y=p+5q has infinitely many solution Then (a) p=2q (b)q=2p (c)p=-2q (d) q=-2p [Ans(b)]

LEVEL- II

1.	Find the value of k for which the given system of equations has unique solution:		
	2x+3y-5=0, kx-6y-8=0	[Ans k≠ -4]	
2.	For what value of k will the following system of linear equations have infinite num	ill the following system of linear equations have infinite number of solution.	

2x+3y-5=2; (k+2)x+(2k+1)y=2(k-1)

- 3. Find two numbers whose sum is 18 and difference is6.
- Solve for x and y. X+6/y=6, 3x-8/y=5.
- The sum of the numerator and the denominator of a fraction is 20 if we subtract 5 from the numerator and 5 from denominator, then the ratio of the numerator and the denominator will be 1:4. Find the fraction.
 [Ans : 7/13]

LEVEL- III

1 Solve the following system of equations by	y using the method of elimination by equating the coefficients:		
x/10+y/5+1=15, x/8+y/6=15.	[Ans x=80, y=30]		
2. If two digit number is four times the sum of its digits and twice the product of digits. Find the number.			
	[Ans 36]		
3.Solve the following system of equations.			
bx/a- ay/b +a +b=0	[Ans x= -3a, y= -b]		
bx –ay +2ab=0			

4. Solve graphically the system of linear equations.
 4x-3y+4=0, 4x +3y=20 also find the area of the region bounded by the lines and x-axis.
 [Ans x=2, y=4, Area=12 sq. unit]

5. The sum of two naturals number is 8 and sum of their reciprocals is 8/15. Find the numbers [Ans 5 and 3]

LEVEL- IV

1. Solve for x and y:

2/2x+y - 1/x-2y +5/9 =0 9/2x+y - 6/x-2y +4 =0

 Draw the graph the following equations: 2x+3y-12=0 and 7x-3y-15=0.Determine the coordinates of the vertices of the triangle formed by the lines and the y-axis. [Ans (0,4),(3,2),(0,-5)]

3. The sum of the digits of a two- digit number is 12 the number obtained by interchanging the two digits exceed the given number by 18. Find the number. [Ans 57]

4.Abdul traveled 300km by train and 200km by taxi, it took him 5 hours 30 minutes. But if he travels 260 km by train and 240 km by bus he takes 6 minutes longer. Find the speed of the train and of the taxi.

[Ans 100 km/hr.,80 km/hr.]

[Ans x=2, y=1/2]

5.Solve the following pairs of equation for x and y.

15/x-y +22/x+y=5, 40/x-y +55/x+y =13.

[Ans x=8, y=3]

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[Ans k=4]

[Ans 12,6]

[Ans x=3, y=2]

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SELF EVALUATION

- 1. Find the value of 'p' if(-3,p) lies on 7x+2y=14.
- Solve the following system of linear equations using the method of cross-multiplication: ax +by =1 bx +ay = (a+b)²/a²+b² =1
- 3. Solve for x and y.

bx + ay = a + b.

ax[1/a-b -1/a+b]+ by [1/b-a -1/b+a]=2

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