



## MATHS

### BOOKS - RS AGGARWAL MATHS (HINGLISH)

#### LINEAR EQUATIONS IN TWO VARIABLES

##### Solved Examples

1. Show that  $x = 3$  and  $y = 2$  is a solution of  $5x - 3y = 9$

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2. Show tha  $x = 5$ ,  $y = 2$  is a solution of the system of linear equation

$$2x + 3y = 16, x - 2y = 1$$

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3. Show that  $x = 3, y = 2$  is not a solution of the system of linear equations  $3x - 2y = 5, 2x + y = 7$



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4. Solve graphically the system of linear equations  $x + 2y = 3, 4x + 3y = 2$



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5. Solve graphically the system of linear equations

$$4x - 5y + 16 = 0 \text{ and } 2x + y - 6 = 0.$$

Determine the vertices of the triangle formed by these lines and the x-axis.



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6. Solve the following system of linear equations graphically:

$4x - 5y - 20 = 0$ ,  $3x + 5y - 15 = 0$  Determine the vertices of the triangle formed by the lines representing the above equation and the y-axis.



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7. Solve the following system of linear equation graphically and shade the region between the two lines and x-axis.

$3x + 2y - 11 = 0$ ,  $2x - 3y + 10 = 0$



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8. Solve the following system of linear equations graphically:

$3x + y - 11 = 0$ ,  $x - y - 1 = 0$ . Shade the region bounded by these lines and y-axis. Also, find the area of the region bounded by these lines and y-axis.



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9. Show graphically that the system of equations  $3x - y = 2$   $9x - 3y = 6$  has infinitely many solutions.



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10. Show graphically that the system of linear equations.

$$2x - 3y = 5, 6y - 4x = 3$$

is inconsistent, i.e., has no solution.



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11. Show graphically that the system of linear equations

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

is inconsistent, i.e., has no solution.



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12. Solve for  $x$  and  $y$ , using substitution method :

$$2x + y = 7, 4x - 3y + 1 = 0$$

A. (2,3)

B. (3,2)

C. (2,4)

D. (1,3)

**Answer: A**



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13. Solve for  $x$  and  $y$  :

$$\frac{3x}{2} - \frac{5y}{3} = -2, \frac{x}{3} + \frac{y}{2} = \frac{13}{6}$$

A. (3, 2)

B. (2, 3)

C. (2, 4)

D. (4, 2)

**Answer: B**



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**14.** Solve for  $x$  and  $y$

$$10x + 3y = 75, 6x - 5y = 11$$

A. (1, 2)

B. (2, 3)

C. (5, 6)

D. (6, 5)

**Answer: D**



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15. Solve the following system of equations:

$$11x + 15y + 23 = 0, \quad 7x - 2y - 20 = 0$$



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16. Solve for  $x$  and  $y$ :

$$0.4x - 1.5y = 6.5,$$

$$0.3x + 0.2y = 0.9.$$

A.  $x = -5$  and  $y = -3$

B.  $x = 5$  and  $y = -3$

C.  $x = 5$  and  $y = 3$

D. none of these

**Answer: B**



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17. Solve the following system of equations:

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

A.  $x = 1, y = 2$

B.  $x = 2, y = 1$

C.  $x = 2, y = 2$

D.  $x = 1, y = 1$

**Answer: C**



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18. Solve for  $x$  and  $y$ :

$$\frac{2}{x} + \frac{3}{y} = 13, \quad \frac{5}{x} - \frac{4}{y} = -2 \quad (x \neq 0 \text{ and } y \neq 0)$$



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19. Solve for  $x$  and  $y$ :

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

A. (6, 4)

B.  $\left(\frac{1}{6}, \frac{1}{4}\right)$

C. (3, 2)

D.  $\left(\frac{1}{3}, \frac{1}{2}\right)$

**Answer: B**



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20. Solve for  $x$  and  $y$ :

$$\frac{1}{7x} + \frac{1}{6y} = 3, \frac{1}{2x} - \frac{1}{3y} = 5(x \neq 0, y \neq 0)$$



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21. Solve for  $x$  and  $y$ :

$$\frac{3a}{x} - \frac{2b}{y} + 5 = 0, \frac{a}{x} + \frac{3b}{y} - 2 = 0 (x \neq 0, y \neq 0)$$

A.  $(-a, -b)$

B.  $(-a, b)$

C.  $(a, -b)$

D.  $(a, b)$

**Answer: A**



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22. Solve for  $x$  and  $y$ :

$$6x + 3y = 7xy, 3x + 9y = 11xy (x \neq 0, y \neq 0)$$

A.  $(2, 2)$

B.  $\left(\frac{3}{2}, 1\right)$

C.  $(2, 3)$

D.  $\left(1, \frac{3}{2}\right)$

**Answer: D**



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23. Solve the following system of equations:

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

A.  $x = 2$  and  $y = 3$

B.  $x = 4$  and  $y = 5$

C.  $x = 6$  and  $y = 7$

D.  $x = 8$  and  $y = 9$

**Answer: B**



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24. Solve the following pairs of equation for  $x$  and  $y$ ,

$$\frac{15}{x-y} + \frac{22}{x+y} = 5 \text{ and } \frac{40}{x-y} + \frac{55}{x+y} = 13$$

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25. Solve:  $\frac{1}{2(2x+3y)} + \frac{12}{7(3x-2y)} = \frac{1}{2} \frac{7}{2x+3y} + \frac{4}{3x-2y} = 2$

where  $2x + 3y \neq 0$  and  $3x - 2y \neq 0$ .

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26. Solve for  $x$  and  $y$  :

$$\frac{2}{\sqrt{x}} + \frac{3}{\sqrt{y}} = 2, \frac{4}{\sqrt{x}} - \frac{9}{\sqrt{y}} = -1 (x \neq 1, y \neq 0)$$

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27. 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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28. Solve for  $x$  &  $y$ :

$$ax + by = a - b, \quad bx - ay = a + b$$

A. 2,3

B. 1,-1

C. 1,2

D. a,b

Answer: B



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29. Solve the following pair of linear equations  $2(ax-by) + (a + 4b) = 0$   $2(bx + ay) + (b-4a) = 0$



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30.  $\frac{ax}{b} - \frac{by}{a} = a + b, ax - by = 2ab$



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31. Solve for x and y  $\sqrt{2}x - \sqrt{3}y = 0, \sqrt{5}x + \sqrt{2}y = 0$

A. (0,0)

B. (1,2)

C. (0,1)

D. none of these

Answer: A



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32. Solve for  $x$  and  $y$ ,

$$37x + 43y = 123, 43x + 37y = 117$$

A.  $x = 1, y = 1$

B.  $x = 2, y = 1$

C.  $x = 1, y = 2$

D.  $x = 2, y = 2$

**Answer: C**



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33. Solve for  $x$  and  $y$ :

$$152x - 378y = -74, -378x + 152y = -604$$



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34.  $\frac{x+1}{2} + \frac{y-1}{3} = 8; \frac{x-1}{3} + \frac{y+1}{2} = 9$

A.  $x = 6, y = 3$

B.  $x = 3, y = 6$

C.  $x = 13, y = 7$

D.  $x = 7, y = 13$

**Answer: D**

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**35.** Solve the following system of equations:

$$\frac{2}{x} + \frac{3}{y} = \frac{9}{xy}, \quad \frac{4}{x} + \frac{9}{y} = \frac{21}{xy}, \quad \text{where } x \neq 0, y \neq 0$$

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**36.** Solve for  $x$  and  $y$  :

$$\frac{xy}{x+y} = \frac{6}{5}, \quad \frac{xy}{y-x} = 6(x \neq 0, y \neq 0 \text{ and } x \neq y).$$

A.  $x = 1, y = 3$



B.  $x = 2, y = 2$

C.  $x = 3, y = 3$

D.  $x = 2, y = 3$

**Answer: D**



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**37.** Solve the following system of equations:

$$\frac{7x - 2y}{xy} = 5, \quad \frac{8x + 7y}{xy} = 15$$



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**38.** Solve the following system of equations by using the method of cross-

multiplication:  $2x + 3y = 17, \quad 3x - 2y = 6$

A.  $x = 4, y = 2$

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

C.  $x = 4, y = 3$

D.  $x = -4, y = 3$

**Answer: C**



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**39.** Solve the following by using cross multiplication method

$$4x - 7y + 28 = 0, 5y - 7x + 9 = 0$$

A.  $x = 4$  and  $y = 5$

B.  $x = 5$  and  $y = 6$

C.  $x = 6$  and  $y = 7$

D.  $x = 7$  and  $y = 8$

**Answer: D**



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40. Solve  $\frac{2}{x} + \frac{3}{y} = 13$ ,  $\frac{5}{x} - \frac{4}{y} = -2$ , where  $x \neq 0$  and  $y \neq 0$ .

A.  $x = \frac{1}{2}$ ,  $y = \frac{1}{3}$

B.  $x = \frac{1}{4}$ ,  $y = \frac{1}{6}$

C.  $x = \frac{1}{6}$ ,  $y = \frac{1}{9}$

D.  $x = \frac{1}{8}$ ,  $y = \frac{1}{12}$

**Answer: A**



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41. Solve:  $ax + by = c$ ,  $bx + ay = 1 + c$



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42. Show that the system of equations

$$2x + 5y = 17, 5x + 3y = 14$$

has a unique solution. Find the solution.



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**43.** Find the value of  $k$  for which the system of equations

$$x - 2y = 3, 3x + ky = 1$$

has a unique solution.

A.  $k \neq 6$

B.  $k \neq 4$

C.  $k \neq 8$

D. None

**Answer: A**



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**44.** Show that the system of equations

$$4x + 6y = 7, 12x + 18y = 21$$

has infinitely many solutions.



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**45.** Find the values of  $k$  for which the following pair of linear equations has infinitely many solutions :

$$2x - 3y = 7, (k + 1)x + (1 - 2k)y = (5k - 4).$$



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**46.** For the following system of equations determine the value of  $k$  for which the given system has infinitely many solutions:

$$kx + 3y = k - 3, \quad 12x + ky = k$$



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**47.** Find the value of  $k$  for which the following system of linear equations has infinite solutions:  $x + (k + 1)y = 5, (k + 1)x + 9y = 8k - 1$



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

$$2x + 3y = 7 \quad (ab)x + (a + b)y = 3a + b$$

(ii) For which value of k will the following pair of linear equations have

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49. Find the value of m & n for which the system of Linear equation has infinity many solutions.  $3x + 4y = 12$

$$(m + n)x + 2(m - n)y = 5m - 1$$

A.  $m = 5, n = 1$

B.  $m = 5, n = 2$

C.  $m = 6, n = 1$

D.  $m = 7, n = 1$

**Answer: A**



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50. Show that the system of equations

$$3x - 5y = 7, 6x - 10y = 3.$$

has no solution.



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51. For what value of  $k$  , will the system of equations

$$x + 2y = 5, \quad 3x + ky - 15 = 0$$
 has (i) a unique solution? (ii) no

solution



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52. 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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53. If the pair of linear equations  $(3k + 1)x + 3y - 2 = 0$  and  $(k^2 + 1)x + (k - 2)y - 5 = 0$  inconsistent, The value of  $k$  is



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54. For what value of  $k$  will the following system of linear equations has no solution?  $3x + y = 1$ ,  $(2k - 1)x + (k - 1)y = 2k + 1$



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55. Find the values(s) of  $k$  for which the system of equations  $kx - y = 2$   
 $6x - 2y = 3$  has (i) a unique solution (ii) no solution. Is there a value of  $k$  for which the system has infinitely many solutions?



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56. Find the value of  $k$  for which the system of equations

$$3x + 5y = 0, \quad kx + 10y = 0$$

has a nonzero solution.

A.  $k = 6$

B.  $k = 5$

C.  $k = 4$

D.  $k = 3$

**Answer: A**



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57. 8 chairs and 5 tables for a classroom cost Rs.10500, while 5 chairs and 3 tables cost Rs. 6450. Find the cost of each chair and that of each table.



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**58.** The coach of a cricket team buys 7 bats and 6 balls for ₹ 13200. Later, he buys 3 bats and 5 balls for ₹ 5900. Find the cost of each bat and each ball.



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**59.** 37 pens and 53 pencils together cost ₹ 955, while 53 pens and 37 pencil together cost ₹ 1115. Find the cost of a pen and that of a pencil.



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**60.** Taxi charges in a city consist of fixed charges and the remaining depending upon the distance travelled in kilometres. If a person travels 60 km, he pays ₹ 960, and for travelling 80 km, he pays ₹ 1260. Find the fixed charges and the rate per kilometre.



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**61.** A part of monthly hostel charges in a school is fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 22 days, he has to pay ₹ 4250 as hostel charge, whereas a student B, who takes food for 28 days, pays ₹ 5150 as hostel charges. Find the fixed charges and the cost of food per day.



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**62.** The monthly incomes of A and B are in the ratio 8:7 and their expenditures are in the ratio 19:16. If each saves ₹ 5000 per month, find the monthly income of each.



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**63.** On selling a T.V. at 5% gain and a fridge at 10% gain, a shopkeeper gains Rs. 2000. But if he sells the T.V. at 10% gain and the fridge at 5% loss. He gains Rs. 1500 on the transaction. Find the actual prices of T.V. and fridge.



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64. A man invested an amount at 12 % per annum simple interest and another amount at 10 % per annum simple interest. He received an annual interest of ₹ 2600. But, if he had interchanged the amounts invested, he would have received ₹ 140 less. What amounts did he invest at the different rates ?



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65.  $A$  and  $B$  each has some money. If  $A$  gives Rs 30 to  $B$  , then  $B$  will have twice the money left with  $A$  . But, if  $B$  gives Rs 10 to  $A$  , then  $A$  will have thrice as much as is left with  $B$  . How much money does each have?



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66. Students of a class are preparing for a drill and are made to stand in rows. If 4 students are extra in a row, then there would be 2 rows less. But

there would be 4 more rows if 4 students are less in a row. The number of students in the class is (a) 56 (b) 65 (c) 69 (d) 96

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**67.** The sum of two numbers is 1000 and the difference between their squares is 256000. Find the numbers.

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**68.** If three times the larger of the two numbers is divided by the smaller one, we get 4 as quotient and 3 as remainder. Also if seven times the smaller number is divided by the larger one, we get 5 as quotient and 1 as remainder. Find the numbers.

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69. The sum of two numbers is 8 and the sum of their reciprocals is  $\frac{8}{15}$ .

Find the numbers.

A. 3 and 5

B. 4 and 5

C. 6 and 5

D. 4 and 6

**Answer: A**



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70. The difference of two numbers is 4. If the difference of their reciprocals is  $\frac{4}{21}$ , find the numbers

A. 3, 7 and  $-3, -7$

B. 5, 9 and  $-5, -9$

C. 7, 11 and  $-7, -11$

D. 9, 13 and  $-9, -13$

**Answer: A**



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71. The sum of the digits of a two-digit number is 12. The number obtained by interchanging its digits exceeds the given number by 18. Find the number.

A. 53

B. 55

C. 57

D. 59

**Answer: C**



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72. The sum of a two digit number and the number obtained by reversing the order of its digits is 99. If the digits differ by 3, find the number.

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73. Seven times a two -digit number is equal to four times the number obtained by reversing the order of its digits. If the difference between the digits is 3, find the number.

A. 30

B. 32

C. 34

D. 36

**Answer: D**

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74. A two - digit number is such that product of its digits is 14. If 45 is added to the number, the digits interchange their places. Find the number.

A.  $x = 2, y = 7$

B.  $x = 3, y = 7$

C.  $x = 2, y = 6$

D.  $x = 4, y = 7$

**Answer: A**



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75. If two digit number is four times the sum of its digits and twice the product of digits. Find the number.

A. 36

B. 63

C. 42

D. 24

**Answer: A**



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76. A fraction becomes  $\frac{1}{3}$ , if 2 is added to both of its numerator and denominator. If 3 is added to both of its numerator and denominator then it becomes  $\frac{2}{5}$ . Find the fraction.



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77. The sum of numerator and denominator of a fraction is 3 less than twice the denominator. If each of the numerator and denominator is decreased by 1, the fraction becomes  $\frac{1}{2}$ . Find the fraction.



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**78.** If the numerator of a fraction is multiplied by 2 and the denominator is reduced by 5 the fraction becomes  $\frac{6}{5}$ . And, if the denominator is doubled and the numerator is increased by 8, the fraction becomes  $\frac{2}{5}$ . Find the fraction.



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**79.** Five years ago, A was thrice as old as B and 10 years later, A shall be twice as old as B. What are the present ages of A and B?



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**80.** Father's age is three times the sum of ages of his two children. After 5 years his age will be twice the sum of ages of two children. Find the age of father.



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**81.** A man travels 370 km partly by train and partly by car. If he covers 250 km by train and the rest by car, it takes him 4 hours. But, if he travels 130 km by train and the rest by car, he takes 18 minutes longer. Find the speed of the train and that of the car.



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**82.** 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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**83.** A train covered a certain distance at a uniform speed. If the train had been 6 km/hr faster than it would have taken 4 hours less than its scheduled time. And, if the train were slower by 6 km/hr, then the train

would have take 6 hours more than the scheduled time. The lengt1 of the journey is 700 *km* b. 720 *km* c. 740 *km* d. 760 *km*

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

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**85.** A boat goes 16 km upstream and 24 km downstream in 6 hrs. Also it covers 12 km upstream and 36 km downstream in the same time. Find the speed of the boat upstream and downstream

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86. 8 men and 12 boys can finish a piece of work in 5 days, while 6 men and 8 boys can finish it in 7 days. Find the time taken by 1 man along and that by 1 boy alone to finish the work.



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87. If the length of a rectangle is reduced by 5 units and its breadth is increased by 2 units then the area of the rectangle is reduced by 80 sq units. However, if we increase its length by 10 units and decrease the breadth by 5 units, its area increased by 50 sq units. Find the length and breadth of the rectangle.



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88. In a  $\triangle ABC$ ,  $\angle C = 3$ ,  $\angle B = 2(\angle A + \angle B)$ , then  $\angle B = ?$



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89. Find the four angles of a cyclic quadrilateral  $ABCD$  in which  $\angle A = (2x - 1)^\circ$  ,  $\angle B = (y + 5)^\circ$   $\angle C = (2y + 15)^\circ$  and  $\angle D = (4x - 7)^\circ$ .

A.  $\angle A = 75^\circ$  ,  $\angle B = 55^\circ$  ,  $\angle C = 115^\circ$  and  $\angle D = 115^\circ$

B.  $\angle A = 65^\circ$  ,  $\angle B = 55^\circ$  ,  $\angle C = 125^\circ$  and  $\angle D = 115^\circ$

C.  $\angle A = 65^\circ$  ,  $\angle B = 55^\circ$  ,  $\angle C = 115^\circ$  and  $\angle D = 115^\circ$

D.  $\angle A = 65^\circ$  ,  $\angle B = 55^\circ$  ,  $\angle C = 115^\circ$  and  $\angle D = 125^\circ$

**Answer: D**



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### Exercise 3 A

1. Solve:  $2x + 3y = 2$ ;  $x - 2y = 8$

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

B.  $x = 5, y = 1$

C.  $x = 6, y = 3$

D.  $x = 7, y = 1$

**Answer: A**



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2.  $3x + 2y = 4$   
 $2x - 3y = 7$



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3.  $2x + 3y = 8,$

$x - 2y + 3 = 0$



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

$2x + y - 8 = 0$



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5.  $3x + 2y = 12,$

$5x - 2y = 4.$



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6. Solve the following system of equations graphically:

$3x + y + 1 = 0;$   $2x - 3y + 8 = 0$



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7. Solve the following system of equations graphically:

$2x + 3y + 5 = 0;$   $3x - 2y - 12 = 0$





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8. Solve the following system of equations graphically:

$$2x - 3y + 13 = 0; \quad 3x - 2y + 12 = 0$$



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9.  $2x + 3y - 4 = 0,$

$$3x - y + 5 = 0$$



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10.  $x + 2y + 2 = 0,$

$$3x + 2y - 2 = 0$$



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11. Find the value of  $x$  and  $y$

$$x - y + 3 = 0, 2x + 3y - 4 = 0.$$



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12. Find the value of  $x$  and  $y$  from the given pair of linear equations:

$$2x - 3y + 4 = 0, x + 2y - 5 = 0$$



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13.  $4x - 3y + 4 = 0, 4x + 3y - 20 = 0.$



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14. ,  $x - y = -1, 3x - 2y = 12$



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15.  $x - 2y + 2 = 0$ ,  $2x + y - 6 = 0$

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16. Solve the following system of equations graphically:  
 $2x - 3y + 6 = 0$ ,  $2x + 3y - 18 = 0$  Also, find the area of the region bounded by these two lines and y-axis.

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17. Solve the following system of equations graphically:  
 $4x - y = 4$ ,  $3x + 2y = 14$  . Shade the region between the lines and the y-axis.

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18.  $x - y - 5 = 0$ ,  $3x + 5y - 15 = 0$

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19. Solve graphically following system of linear equations. Also find the coordinates of the points where the lines meet axis of  $y$ .

$$2x - 5y + 4 = 0, \quad 2x + y - 8 = 0$$

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20.  $5x - y - 7 = 0, x - y + 1 = 0$

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21.  $2x - 3y = 12, x + 3y = 6.$

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22. Show graphically that following system of equations has infinitely many solutions:  $2x + 3y = 6; 4x + 6y = 12$



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23.  $3x - y = 5$ ,  $6x - 2y = 10$ .



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24.  $2x + y = 6$ ,  $6x + 3y = 18$ .



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25. Show graphically that following system of equations has infinitely many solutions:  $x - 2y = 5$ ;  $3x - 6y = 15$



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26. Solve the following system of equations graphically:

$x - 2y = 6$ ;  $3x - 6y = 0$



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27.  $2x + 3y = 4$ ,  $4x + 6y = 12$ .



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28. show graphically that system of equations  $2x + y = 6$ ,  $6x + 3y = 18$ .  
has infinitely many solutions.



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29. Draw the graphs of the following equations on the same graph paper:  
 $2x + y = 2$ ;  $2x + y = 6$ . Find the coordinates of the vertices of the  
trapezium formed by these lines. Also, find the area of the trapezium so  
formed.



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## Exercise 3 B

1. Solve:  $x + y = 3$ ,

$$4x - 3y = 26.$$

A.  $x = 5, y = -2$

B.  $x = 6, y = -2$

C.  $x = 5, y = -1$

D.  $x = 7, y = -2$

**Answer: A**



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2. solve:

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

A.  $x = 8, y = 6$



B.  $x = 7, y = 6$

C.  $x = 9, y = 6$

D.  $x = 9, y = 5$

**Answer: C**



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3.  $2x + 3y = 0,$

$3x + 4y = 5.$

A.  $x = 15, y = 15$

B.  $x = 5, y = -10$

C.  $x = 15, y = 10$

D.  $x = 15, y = -10$

**Answer: D**



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4.  $2x - 3y = 13; 7x - 2y = 20$

A.  $x = 2, y = -3$

B.  $x = -2, y = -3$

C.  $x = 2, y = 3$

D.  $x = 12, y = -3$

**Answer: A**



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5.  $3x - 5y - 19 = 0,$

$-7x + 3y + 1 = 0$

A.  $x = 2, y = -5.$

B.  $x = -2, y = 5.$

C.  $x = -12, y = -5.$

$$D. x = -2, y = -15.$$

**Answer: A**



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6. Solve the following system of equations:

$$3x - 7y + 10 = 0, \quad y - 2x - 3 = 0$$

A.  $x = -1, y = 13$

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

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

D.  $x = -2, y = 1$

**Answer: B**



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7. Find  $x$  and  $y$ :  $\frac{x}{2} - \frac{y}{9} = 6$ ,

$$\frac{x}{7} + \frac{y}{3} = 5.$$

A.  $x = 14, y = 9$

B.  $x = 15, y = 9$

C.  $x = 14, y = 3$

D.  $x = 16, y = 9$

**Answer: A**



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8. Solve the following system of equations:

$$\frac{x}{3} + \frac{y}{4} = 11, \quad \frac{5x}{6} - \frac{y}{3} = -7$$

A.  $x = 16, y = 36$

B.  $x = 6, y = -36$

C.  $x = 6, y = 36$

$$D. x = -6, y = 36$$

**Answer: C**



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$$9. 4x - 3y = 8, 6x - y = \frac{29}{3}$$



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$$10. 2x - \frac{3y}{4} = 3,$$

$$5x = 2y + 7.$$

A.  $x = 3, y = 4$

B.  $x = -3, y = 4$

C.  $x = 3, y = -4$

D.  $x = -3, y = -4$

**Answer: A**



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$$11. 2x + 5y = \frac{8}{3}, 3x - 2y = \frac{5}{6}$$



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$$12. 2x + 3y + 1 = 0,$$

$$\frac{7 - 4x}{3} = y$$

A.  $x = 4, y = -3$

B.  $x = 2, y = -3$

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

D.  $x = 5, y = -3$

**Answer: A**



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13.  $0.4x + 0.3y = 1.7,$

$0.7x - 0.2y = 0.8$

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14. If  $0.5x + 0.7y = 0.74$  and  $0.3x + 0.5y = 0.5$  then

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15. Solve the following system of equations:

$7(y + 3) - 2(x + 2) = 14,$      $4(y - 2) + 3(x - 3) = 2$

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16.  $6x + 5y = 7x + 3y + 1 = 2(x + 6y - 1)$

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$$17. \frac{x + y - 8}{2} = \frac{x + 2y - 14}{3} = \frac{3x + y - 12}{11}$$



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$$18. \frac{5}{x} + 6y = 13,$$

$$\frac{3}{x} + 4y = 7(x \neq 0)$$



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$$19. x + \frac{6}{y} = 6,$$

$$3x - \frac{8}{y} = 5(y \neq 0)$$



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20. Solve the following system of equations:

$$2x - \frac{3}{y} = 9, \quad 3x + \frac{7}{y} = 2, \quad y \neq 0$$







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$$21. \frac{3}{x} - \frac{1}{y} + 9 = 0,$$

$$\frac{2}{x} + \frac{3}{y} = 5(x \neq 0, y \neq 0)$$



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$$22. \frac{9}{x} - \frac{4}{y} = 8,$$

$$\frac{13}{x} + \frac{7}{y} = 101(x \neq 0, y \neq 0)$$

A.  $x = \frac{1}{2}, y = \frac{1}{7}$

B.  $x = \frac{1}{4}, y = \frac{1}{7}$

C.  $x = \frac{1}{4}, y = \frac{1}{3}$

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

**Answer: B**



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$$23. \frac{5}{x} - \frac{3}{y} = 1,$$

$$\frac{3}{2x} + \frac{2}{3y} = 5(x \neq 0, y \neq 0)$$

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$$24. \frac{1}{2x} + \frac{1}{3y} = 2,$$

$$\frac{1}{3x} + \frac{1}{2y} = \frac{13}{6}(x \neq 0, y \neq 0)$$

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$$25. 4x + 6y = 3xy,$$

$$8x + 9y = 5xy(x \neq 0, y \neq 0)$$

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$$26. x + y = 5xy,$$

$$3x + 2y = 13xy(x \neq 0, y \neq 0)$$



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27. Solve the following system of equations:

$$\frac{5}{x+y} - \frac{2}{x-y} = -1, \quad \frac{15}{x+y} + \frac{7}{x-y} = 10$$

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28. Solve:  $\frac{3}{x+y} + \frac{2}{x-y} = 2$  and  $\frac{9}{x+y} - \frac{4}{x-y} = 1$ .

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29.  $\frac{5}{x+1} - \frac{2}{y-1} = \frac{1}{2}$ ,  
 $\frac{10}{x+1} + \frac{2}{y-1} = \frac{5}{2}, x \neq -1$  and  $y \neq 1$

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30.  $\frac{44}{x+y} + \frac{30}{x-y} = 10$   $\frac{55}{x+y} + \frac{40}{x-y} = 13$

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$$31. \frac{10}{x+y} + \frac{2}{x-y} = 4,$$
$$\frac{15}{x+y} - \frac{9}{x-y} = -2.$$

A.  $x = \frac{21}{8}, y = \frac{9}{8}$

B.  $x = \frac{21}{4}, y = \frac{9}{8}$

C.  $x = \frac{21}{8}, y = -\frac{9}{8}$

D.  $x = \frac{21}{8}, y = \frac{9}{4}$

**Answer: A**

32. Solve For x and y :  $71x + 37y = 253,$

$37x + 71y = 287.$

33.  $217x + 131y = 913$   
 $131x + 217y = 827$

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34. Solve the given pair of equations:

$$23x - 29y = 98,$$

$$29x - 23y = 110$$

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35.  $\frac{2x + 5y}{xy} = 6,$   
 $\frac{4x - 5y}{xy} = -3$

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

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37. 
$$\frac{1}{2(x+2y)} + \frac{5}{3(3x-2y)} = \frac{-3}{2}$$
$$\frac{5}{4(x+2y)} - \frac{3}{5(3x-2y)} = \frac{61}{60}$$

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38. Solve the following system of equations:

$$\frac{2}{3x+2y} + \frac{3}{3x-2y} = \frac{17}{5}, \quad \frac{5}{3x+2y} + \frac{1}{3x-2y} = 2$$

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39. Solve for  $x$  and  $y$ :

$$6x + 3y = 7xy, \quad 3x + 9y = 11xy (x \neq 0, y \neq 0)$$

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40.  $x + y = a + b, ax - by = a^2 - b^2$

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41. Solve:  $\frac{x}{a} + \frac{y}{b} = 2$ ,  $ax - by = a^2 - b^2$



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42. Solve for  $x$  and  $y$  by cross-multiplication :

$$px + qy = p - q, qx - py = p + q$$

A.  $x = 1, y = -1$

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

C.  $x = 3, y = -3$

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

Answer: A



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43.  $\frac{x}{a} - \frac{y}{b} = 0, ax + by = a^2 + b^2$



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44.  $6(ax + by) = 3a + 2b$  &  $6(bx - ay) = 3b - 2a$



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45.  $ax - by = a^2 + b^2$   
 $x + y = 2a$

Solve the above equations

A.  $x = a - b, y = a - b$

B.  $x = a - b, y = a + b$

C.  $x = a + b, y = a - b$

D. none of these

Answer: C







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$$46. \frac{bx}{a} - \frac{ay}{b} + a + b = 0 \text{ and } bx - ay + 2ab$$



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$$47. \frac{bx}{a} + \frac{ay}{b} = a^2 + b^2,$$

$$x + y = 2ab$$



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$$48. x + y = a + b, ax - by = a^2 - b^2$$



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$$49. \text{Solve for } x \text{ and } y \quad a^2x + b^2y = c^2,$$

$$b^2x + a^2y = d^2$$



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50. Solve:  $\frac{x}{a} + \frac{y}{b} = a + b$

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

find x and y



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### Exercise 3 C

1. Solve

$$x + 2y + 1 = 0$$

$$2x - 3y - 12 = 0$$

A.  $x = -3, y = -2$

B.  $x = 3, y = -2$

C.  $x = 3, y = 2$

D.  $x = -3, y = 2$

**Answer: B**



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2.  $3x - 2y + 3 = 0$ ;  $4x + 3y - 47 = 0$



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3.  $6x - 5y - 16 = 0$ ,

$7x - 13y + 10 = 0$ .



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4. Solve the following system of equations by method of cross-multiplication:  $3x + 2y + 25 = 0$ ,  $2x + y + 10 = 0$

A.  $x = 5, y = -5$

B.  $x = 5, y = -10$

C.  $x = 5, y = -15$

D.  $x = 5, y = -20$

**Answer: D**



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5.  $2x + 5y = 1,$

$2x + 3y = 3.$



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6. Solve the following system of equations by method of cross-multiplication:  $2x + y = 35,$   $3x + 4y = 65$

A.  $x = 5, y = 5$

B.  $x = 10, y = 5$

C.  $x = 15, y = 5$

$$D. x = 20, y = 5$$

Answer: C



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$$7.7x - 2y = 3,$$

$$22x - 3y = 16.$$



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$$8. \frac{x}{3} + \frac{y}{15} = 4$$

$$\frac{x}{3} - \frac{y}{12} = \frac{19}{4}$$



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$$9. \frac{1}{x} + \frac{1}{y} = 7,$$

$$\frac{2}{x} + \frac{3}{y} = 17(x \neq 0, y \neq 0).$$



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$$10. \frac{5}{(x+y)} - \frac{2}{(x-y)} + 1 = 0,$$

---


$$(x+y) + \frac{7}{(x-y)} - 10 = 0 \quad (x \neq y, x \neq -y)$$



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$$11. \frac{ax}{b} - \frac{by}{a} = a + b, ax - by = 2ab$$



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12. Solve the following system of equations by method of cross-multiplication:  $2ax + 3by = a + 2b$ ,  $3ax + 2by = 2a + b$

$$A. x = \frac{(5b - a)}{4b}, y = \frac{(5a - b)}{4a}$$

$$B. x = \frac{(5a - b)}{4a}, y = \frac{(5b - a)}{4b}$$

$$C. x = \frac{(4b - a)}{5b}, y = \frac{(4a - b)}{5a}$$

$$D. x = \frac{(4a - b)}{5a}, y = \frac{(4b - a)}{5b}$$

Answer: D



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$$13. \frac{a}{x} - \frac{b}{y} = 0, \frac{ab^2}{x} + \frac{a^2b}{y} = a^2 + b^2$$

find x and y



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### Exercise 3 D

$$1. 3x + 5y = 12, 5x + 3y = 4.$$



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$$2. \begin{aligned} 2x - 3y &= 17 \\ 4x + y &= 13 \end{aligned}$$



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



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4. 
$$2x - 3y - 5 = 0$$
$$kx - 6y - 8 = 0$$



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5. 
$$x - ky = 2$$
$$3x + 2y = -5$$



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6. 
$$5x - 7y - 5 = 0, 2x + ky - 1 = 0$$



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7. Find the value of  $k$  for which the following system of equations has a unique solution:  $4x + ky + 8 = 0$ ,  $2x + 2y + 2 = 0$



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8. Find the value of  $k$  for which the following system of equations has a unique solution:  $4x - 5y = k$ ,  $2x - 3y = 12$



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9.  $kx + 3y = k - 3$   
 $12x + ky = k$



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10. Show that the system of equations.

$$2x - 3y = 5, 6x - 9y = 15.$$

has an infinite number of solutions.

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11. Show that the system of equations

$$6x + 5y = 11, 9x + \frac{15}{2}y = 21.$$

has no solution

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12. For what value of  $k$  does the system of equations

$$kx + 2y = 5, 3x - 4y = 10$$

have (i) a unique solution, (ii) no solution ?

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13. For what value of  $k$ , will the system of equations

$x + 2y = 5, 3x + ky - 15 = 0$  has (i) a unique solution? (ii) no

solution

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14. For what value of  $k$  does the system of equations

$$x + 2y = 3, 5x + ky + 7 = 0$$

have (i) a unique solution, (ii) no solution ?

Also, show that there is no value of  $k$  for which the given system equations has infinitely many solutions.



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15. For what value of  $k$  does the system of linear equations  $2x + 3y = 7$

$(k - 1)x + (k + 2)y = 3k$  have an infinite number of solutions



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16.  $2x + (k - 2)y = k$   
 $6x + (2k - 1)y = 2k + 5$



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17. Find the value of  $k$  for which following system of equations have infinitely many solution:  $kx + 3y = 2k + 1$ ,  $2(k + 1)x + 9y = 7k + 1$

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18. Find the value of  $k$  for infinite solutions:  $5x + 2y = 2k$ ,

$$2(k + 1)x + ky = (3k + 4)$$

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19.  $(k - 1)x - y = 5$ ,

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

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20.  $(k - 3)x + 3y = k$   
 $kx + ky = 12$

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21.  $(a - 1)x + 3y = 2,$

$6x + (1 - 2b)y = 6.$



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22.  $(2a - 1)x + 3y - 5 = 0$

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



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23. If  $2x - 3y = 7$  and  $(a + b)x - (a + b - 3)y = 4a + b$  represent coincident lines, then a and b satisfy the equation ?



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24. Find the values of a and b for which the following system of linear equations has infinitely many solutions

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

$$(a + b + 1)x + (a + 2b + 2)y = 4(a + b) + 1$$

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25.  $2x + 3y = 7,$

$$(a + b)x + (2a - b)y = 21.$$

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26. If the system of equations  $2x + 3y = 7$  and  $2ax + (a + b)y = 28$  has infinitely many solutions, then which one of the following is correct ?

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27.  $8x + 5y = 9, kx + 10y = 15.$

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28.  $kx + 3y = 3, 12x + ky = 6.$

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29.  $3x - y - 5 = 0, 6x - 2y + k = 0(k \neq 0)$

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30.  $kx + 3y = k - 3, 12x + ky = k$

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31. Find the value of  $k$  for which the system of equations

$5x - 3y = 0, 2x + ky = 0$  has a nonzero solution.

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## Exercise 3 E

1. 5 chairs and 4 tables together cost ₹ 5600, while 4 chairs and 3 tables together cost ₹ 4340. Find the cost of a chair and that of a table.

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2. 23 spoons and 17 forks together cost ₹ 1770, while 17 spoons and 23 forks together cost ₹ 1830. Find the cost of a spoon and that of a fork.

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3. A lady has only 25-paisa and 50-paisa coins in her purse. If she has 50 coins in all totalling 19.50, how many coins of each kind she have?

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4. The sum of two numbers is 137 and their difference is 43. Find the numbers.



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5. Find two numbers such that the sum of twice the first and thrice the second is 92, and four times the first exceeds seven times the second by 2.



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6. Find two numbers such that the sum of thrice the first and the second is 142, and four times the first exceeds the second by 138.



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7. If 45 is subtracted from twice the greater of two numbers, it results in the other number. If 21 is subtracted from twice the smaller number, it

results in the greater number. Find the numbers.



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8. If three times the larger of two numbers is divided by the smaller, we get 4 as the quotient and 8 as the remainder. If five times the smaller is divided by the larger, we get 3 as the quotient and 5 as the remainder. Find the numbers.



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9. If 2 is added to each of two given numbers, their ratio becomes 1 : 2. However, if 4 is subtracted from each of the given numbers, the ratio becomes 5 : 11. Find the numbers.



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**10.** The difference between two numbers is 14 and the difference between their squares is 448. Find the numbers.

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**11.** The sum of the digits of a two-digit number is 12. The number obtained by interchanging its digits exceeds the given number by 18. Find the number.

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**12.** A number consisting of two digits is seven times the sum of its digits. When 27 is subtracted from the number, the digits are reversed. Find the number.

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**13.** The sum of digits of a two digit number is 15. The number obtained by reversing the order of digits of the given number exceeds the given number by 9. Find the given number.



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**14.** A two-digit number is 3 more than 4 times the sum of its digits. If 18 is added to the number, the digits are reversed. Find the number.



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**15.** A number consists of two digits. When it is divided by the sum of its digits, the quotient is 6 with no remainder. When the number is diminished by 9, the digits are reversed. Find the number.



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**16.** A two-digit number is such that the product of its digits is 35. If 18 is added to the number, the digits interchange their places. Find the number.



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**17.** A two digit number is such that the product of its digits is 18. When 63 is subtracted from the number, the digits interchange their places. Find the number.



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**18.** The sum of a two digit number and the number obtained by reversing the order of its digits is 121, and the two digits differ by 3. Find the number.



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19. The sum of the numerator and denominator of a fraction is 8. If 3 is added to both of the numerator and the denominator, the fraction becomes  $\frac{3}{4}$ . Find the fraction.

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20. If 2 is added to the numerator of a fraction, it reduces to  $\frac{1}{2}$  and if 1 is subtracted from the denominator, it reduces to  $\frac{1}{3}$ . Find the fraction.

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21. The denominator of a fraction is greater than its numerator by 11. If 8 is added to both its numerator and denominator, it becomes  $\frac{3}{4}$ . Find the fraction .

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**22.** In a given fraction, if 1 is subtracted from the numerator and 2 is added to the denominator, it becomes  $\frac{1}{2}$ . If 7 is subtracted from the numerator and 2 is subtracted from the denominator, it becomes  $\frac{1}{3}$ . The fraction is

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**23.** The sum of the numerator and denominator of a fraction is 4 more than twice the numerator. If the numerator and denominator are increased by 3, they are in the ratio 2 : 3. Determine the fraction.

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**24.** The sum of two numbers is 16. The sum of their reciprocals is  $\frac{1}{3}$ . Find the numbers.

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25. There are two examination rooms A and B. If 10 candidates are sent A and B, the number of students in each room is same. If 20 candidates are sent from B to A, the number of students in A is double the number of students in B. Find the number of students in each room.



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26. Taxi charges in a city consist of fixed charges and the remaining depending upon the distance travelled in kilometres. If a man travels 80 km, he pays ₹ 1330, and travelling 90 km, he pays ₹ 1490. Find the fixed charges and rate per km.



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27. A part of monthly hostel charges is fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 25 days he has to pay 4500 as hostel charges whereas a



student who takes B food for 30 days, pays 5200 as hostel charges. Find the fixed charges per month and the cost of food per day.

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**28.** A man invested an amount at 10% per annum and another amount at 8% per annum simple interest. Thus, he received ₹ 1350 as annual interest. Had he interchanged the amounts invested, he would have received ₹ 45 less as interest. What amounts did he invest at different rates ?

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**29.** The monthly incomes of A and B are in the ratio 5 : 4 and their monthly expenditures are in the ratio 7:5. If each saves ₹ 9000 per month, find the monthly income of each.

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**30.** A man sold a chair and a table together for  $Rs.1,520$  thereby making a profit of  $25\%$  on the chair and  $10\%$

**30.** on the table. By selling them together for  $rs\ 1535$  he could have made a profit of  $10\%$  on the chair and  $25\%$  on the table. Find the cost price of each

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**31.** Points  $A$  and  $B$  are  $70\text{ km.}$  apart on a highway. A car starts from  $A$  and another car starts from  $B$  simultaneously. If they travel in the same direction, they meet in  $7$  hours, but if they travel towards each other, they meet in one hour. Find the speed of the two cars.

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**32.** A train covered a certain distance at a uniform speed. If the train had been  $5\text{ kmph}$  faster, it would have taken  $3$  hours less than the

scheduled time. And, if the train were slower by 4 kmph, it would have taken 3 hours more than the scheduled time. Find the length of the journey.

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

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**34.** Places A and B are 160 km apart on a highway. One car starts from A and another from B at the same time. If they travel in the same direction, they meet in 8 hours. But, if they travel towards each other, they meet in 2 hours. Find the speed of each car.

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**35.** A sailor goes 8 km downstream in 40 minutes and returns in 1 hours. Determine the speed of the sailor in still water and the speed of the current.



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**36.** A boat goes 12 km upstream and 40 km downstream in 8 hours. It can go 16 km upstream and 32 km downstream in the same time. Find the speed of the boat in still water and the speed of the stream.



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**37.** 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 woman alone to finish the work, and also that taken by 1 man alone.



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**38.** The length of a room exceeds its breadth by 3 meters. If the length is increased 3 meters and the breadth is decreased by 2 meters, the area remains the same. Find the length and the breadth of the room.

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**39.** The area of rectangle gets reduced by  $8m^2$ , when its length is reduced by 5 m and its breadth is increased by 3m. If we increase the length by 3m and breadth by 2m then area increase by  $74m^2$  of the rectangle. Find the length and breadth of rectangle

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**40.** The area of a rectangle gets reduced by 67 square meters, when its length is increased by 3m and breadth is decreed by 4m. If the length is reduced by 1 m breadth is increased by 4m, the area is increased by 89 square meters. Find the dimesions of the rectangle.



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41. A railways half ticket costs half the full fare and the reservation charge is the same of half ticket as on full ticket. One reserved first class ticket from Mumbai to Delhi cost ₹4150 while one full and one half reserved first class ticket cost ₹6255. What is the basic first class full fare and what is the reservation charges?



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42. Five years hence, fathers age will be three times the age of his son. Five years ago, father was seven times as old as his son. Find their present ages.



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43. Two years ago, a father was five times as old as his son. Two years later, his age will be 8 more than three times the age of the son. Find

the present ages of father and son.

A. 37,15

B. 47, 5

C. 42 , 10

D. 32, 20

**Answer: C**



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**44.** If twice the sons age in years is added to the fathers age, the sum is 70. But if twice the fathers age is added to the sons age, the sum is 95. Find the ages of father and son.

A. 30 years, 25 years

B. 50 years, 5 years

C. 40 years, 15 years

D. none of these

**Answer: C**



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**45.** The present age of a woman is 3 years more than three times the age of her daughter. Three years hence, the woman's age will be 10 years, more than twice the age of her daughter. Find their present ages.



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**46.** On selling a tea-set 5% loss and a lemon-set at 15% gain, a crockery seller gains Rs. 7. If he sells the tea-set at 5% gain and the lemon-set at 10% gain, he gains Rs. 13. Find the actual price of the tea-set and the lemon-set.



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**47.** 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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**48.** A chemist has one solution containing 50% acid and a second one containing 25% acid. How much of each should be used to make 10 litres of a 40% acid solution?

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**49.** A jeweller has bars of 18 carat gold and 12 carat gold. How much of each must be melted together to obtain a bar of 16 carat gold, weighing 120g (Given pure gold is of 24 carat.)?

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50. 90% and 97% pure acid solutions are mixed to obtain 21 litres of 95% pure acid solution. Find the quantity of each type of acids to be mixed to form the mixture.

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

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52. In a  $ABC$  ,  $\angle A = x^\circ$ ,  $\angle B = (3x - 2)^\circ$ ,  $\angle C = y^\circ$  . Also,  $\angle C - \angle B = 9^\circ$  . Find the three angles.

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53. In a cyclic quadrilateral  $ABCD$ ,  
 $\angle A = (2x + 4)^\circ$ ,  $\angle B = (y + 3)^\circ$ ,  $\angle C = (2y + 10)^\circ$ ,  $\angle D = (4x - 5)^\circ$ .  
Find the four angles.



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### Exercise 3 F

1. Write the number of solutions of the following pair of linear equations:  $x + 2y - 8 = 0$ ,  $2x + 4y = 16$



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2. For what value of  $k$  does the system of linear equations  $2x + 3y = 7$   $(k - 1)x + (k + 2)y = 3k$  have an infinite number of solutions



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3. For what value of  $k$ , the following pair of linear equations has infinitely many solutions?

$$10x + 5y - (k - 5) = 0, \quad 20x + 10y - k = 0$$

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4. For what value of  $k$  will the following pair of linear equations have no solution ?

$$2x + 3y - 4 = 0 \text{ and } 2x + 6y - 7 = 0$$

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5. Write the number of solutions of the following pair of linear equations:  $x + 3y - 4 = 0$ ,  $2x + 6y = 7$

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6. Write the value of  $k$  for which the system of equations  $3x + ky = 0$ ,  $2x - y = 0$  has a unique solution.

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7. The difference between two numbers is 5 and the difference between their squares is 65. Find the numbers.

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8. The cost of 5 pens and 8 pencils is ₹ 120, while the cost of 8 pens and 5 pencils is ₹ 153. Find the cost of 1 pen and that of 1 pencil.

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9. The sum of two numbers is 80. If the larger number exceeds four times the smaller one by 5. Find the numbers.





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10. A number consists of two digits whose sum is 8 if 18 is added to the number its digits are reversed find the number



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11. A man purchased 47 stamps of 20 p and 25 p for ₹ 10. Find the number of each type of stamps.



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12. A man has some hens and cows. If the number of heads be 48 and number of feet be 140, how many cows are there ?

A. 26

B. 25

C. 22

**Answer: C****Watch Video Solution**

13. Solve the following system of equations:

$$\frac{2}{x} + \frac{3}{y} = \frac{9}{xy}, \quad \frac{4}{x} + \frac{9}{y} = \frac{21}{xy}, \quad \text{where } x \neq 0, y \neq 0$$

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14. If  $\frac{x}{4} + \frac{y}{3} = \frac{5}{12}$  and  $\frac{x}{2} + y = 1$  then find the value of  $(x + y)$ .

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15. If  $12x + 17y = 53$  and  $17x + 12y = 63$  then find the values of  $(x + y)$

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16. Find the value of  $k$  for which the system of equations

$$3x + 5y = 0, \quad kx + 10y = 0$$

has a nonzero solution.

A.  $k = 3$

B.  $k = 6$

C.  $k = 9$

D.  $k = 12$

**Answer: B**



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17. Find the values(s) of  $k$  for which the system of equations

$$kx - y = 2 \quad 6x - 2y = 3$$

has (i) a unique solution (ii) no solution. Is there a value of  $k$  for which the system has infinitely many solutions?



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18. The value of  $k$  for which the system of equations  $2x + 3y = 5$ ,  $4x + ky = 10$  has infinite number of solutions, is

A. 1

B. 3

C. 6

D. 0

**Answer: C**

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19. Show that the system  $2x + 3y - 1 = 0$ ,  $4x + 6y - 4 = 0$  has no solution.

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20. Find  $k$  for which the system  $x + 2y = 3$  and  $5x + ky + 7 = 0$  is inconsistent.

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21. Solve :  $\frac{3}{x+y} + \frac{2}{x-y} = 2$  and  $\frac{9}{x+y} - \frac{4}{x-y} = 1$ .

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### Multiple Choice Questions Mcq

1. If  $2x + 3y = 12$  and  $3x - 2y = 5$  then

A.  $x = 2, y = 3$

B.  $x = 2, y = -3$

C.  $x = 3, y = 2$

D.  $x = 3, y = -2$

**Answer: C**



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2. If  $x - y = 2$  and  $\frac{2}{x + y} = \frac{1}{5}$  then

A.  $x = 4, y = 2$

B.  $x = 5, y = 3$

C.  $x = 6, y = 4$

D.  $x = 7, y = 5$

**Answer: C**



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3. If  $\frac{2x}{3} - \frac{y}{2} + \frac{1}{6} = 0$  and  $\frac{x}{2} + \frac{2y}{3} = 3$  then

A.  $x = 2, y = 3$

B.  $x = -2, y = 3$

C.  $x = 2, y = -3$

D.  $x = -2, y = -3$

**Answer: A**



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4. If  $\frac{1}{x} + \frac{2}{y} = 4$  and  $\frac{3}{y} - \frac{1}{x} = 11$  then

A.  $x = 2, y = 3$

B.  $x = -2, y = 3$

C.  $x = \frac{-1}{2}, y = -3$

D.  $x = \frac{-1}{2}, y = \frac{1}{3}$

**Answer: D**



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5. If  $\frac{2x + y + 2}{5} = \frac{3x - y + 1}{3} = \frac{2x + 2y + 1}{6}$  then

A.  $x = 1, y = 1$

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

C.  $x = 1, y = 2$

D.  $x = 2, y = 1$

**Answer: A**



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6. Solve :  $\frac{3}{x + y} + \frac{2}{x - y} = 2$  and  $\frac{9}{x + y} - \frac{4}{x - y} = 1$ .

A.  $x = \frac{1}{2}, y = \frac{3}{2}$

B.  $x = \frac{5}{2}, y = \frac{1}{2}$

C.  $x = \frac{3}{2}, y = \frac{1}{2}$

D.  $x = \frac{1}{2}, y = \frac{5}{2}$ .

**Answer: B**



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7. If  $4x + 6y = 3xy$  and  $8x + 9y = 5xy$  then

A.  $x = 2, y = 3$

B.  $x = 1, y = 2$

C.  $x = 3, y = 4$

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

**Answer: C**



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8. If  $29x + 37y = 103$  and  $37x + 29y = 95$  then

A.  $x = 1, y = 2$

B.  $x = 2, y = 1$

C.  $x = 3, y = 2$

D.  $x = 2, y = 3$

**Answer: A**



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9. If  $2^{x+y} = 2^{x-y} = \sqrt{8}$  then the value of  $y$  is

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

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

C. 0

D. none of these

**Answer: C**



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10. If  $\frac{2}{x} + \frac{3}{y} = 6$  and  $\frac{1}{x} + \frac{1}{2y} = 2$  then

A.  $x = 1, y = \frac{2}{3}$

B.  $x = \frac{2}{3}, y = 1$

C.  $x = 1, y = \frac{3}{2}$

D.  $x = \frac{3}{2}, y = 1$

**Answer: B**



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11. The system  $kx - y = 2$  and  $6x - 2y = 3$  has a unique solution only when

A.  $k = 0$

B.  $k \neq 0$

C.  $k = 3$

D.  $k \neq 3$



**Answer: D**



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**12.** The system  $x - 2y = 3$  and  $3x + ky = 1$  has a unique solution, when

A.  $k = -6$

B.  $k \neq -6$

C.  $k = 0$

D.  $k \neq 0$

**Answer: B**



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**13.** For what value of  $k$  does the system of equations  $x + 2y = 3$  and  $5x + ky + 7 = 0$  have no solution

A.  $k = 10$

B.  $k \neq 10$

C.  $k = \frac{-7}{3}$

D.  $k = -21$

**Answer: A**



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**14.** 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.  $\frac{3}{2}$

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

**Answer: D**

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15. For what value of  $k$  do the equations  $kx - 2y = 3$  and  $3x + y = 5$  represent two lines intersecting at a unique point?

- A.  $k = 3$  only
- B.  $k = -3$  only
- C.  $k = 6$  only
- D. all real values except  $-6$

**Answer: D**

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16. 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**



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17. 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**



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18. If a pair of linear equations is consistent then their graph lines will be

- A. parallel
- B. always coincident
- C. always intersecting
- D. intersecting or coincident

**Answer: D**



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19. If a pair of linear equations is inconsistent then their graph lines will be

- A. parallel
- B. always coincident

C. always intersecting

D. intersecting or coincident

**Answer: A**



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20. In a  $\triangle ABC$ ,  $\angle C = 3\angle B = 2(\angle A + \angle B)$ , then  $\angle B = ?$

A.  $20^\circ$

B.  $40^\circ$

C.  $60^\circ$

D.  $80^\circ$

**Answer: B**



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21. In a cyclic quadrilateral ABCD, it is being given that

$\angle A = (x + y + 10)^\circ$ ,  $\angle B = (y + 20)^\circ$ ,  $\angle C = (x + y - 30)^\circ$  and  $\angle D =$

. Then,  $\angle B$  ?

A.  $70^\circ$

B.  $80^\circ$

C.  $100^\circ$

D.  $110^\circ$

**Answer: B**



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22. The sum of digits of a two-digit number is 15. The number obtained by reversing the order of digits of the given number exceeds the given number by 9. Find the given number.

A. 96

B. 69

C. 87

D. 78

**Answer: D**



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**23.** In a given fraction, if 1 subtracted from the numerator and 2 is added to the denominator, it becomes  $\frac{1}{2}$ . If 7 is subtracted from the numerator and 2 is subtracted from the denominator, it becomes  $\frac{1}{3}$ .

The fraction is

A.  $\frac{13}{24}$

B.  $\frac{15}{26}$

C.  $\frac{16}{27}$

D.  $\frac{16}{21}$



**Answer: B**



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24. 5 years hence, the age of a man shall be 3 times the age of his son while 5 years earlier the age of the man was 7 times the age of his son. The present age of the man is

A. 45 years

B. 50 years

C. 47 years

D. 40 years

**Answer: D**



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25. The graphs of the equations  $6x - 2y + 9 = 0$  and  $3x - y + 12 = 0$  lines which are

- A. coincident
- B. parallel
- C. intersecting exactly at one point
- D. perpendicular to each other

**Answer: B**



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26. The graphs of the equations  $2x + 3y - 2 = 0$  and  $x - 2y - 8 = 0$  lines which are

- A. coincident
- B. parallel
- C. intersecting exactly at one point

D. perpendicular to each other

**Answer: C**



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27. The graphs of the equations  $5x - 15y = 8$  and  $3x - 9y = \frac{24}{5}$  are two lines which are

A. coincident

B. parallel

C. intersecting exactly at one point

D. perpendicular to each other

**Answer: A**



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1. The graphical representation of the equations  $x + 2y = 3$  and  $2x + 4y + 7 = 0$  gives a pair of

- A. parallel lines
- B. intersecting lines
- C. coincident lines
- D. none of these

**Answer: A**

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2. Find the values of  $a$  and  $b$  for which the following system of linear equations has infinite number of solutions:

$$2x - 3y = 7, \quad (a + b)x - (a + b - 3)y = 4a + b$$

- A.  $a = 5, b = 1$
- B.  $a = -5, b = 1$

C.  $a = 5, b = -1$

D.  $a = -5, b = -1$

**Answer: D**



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3. The pair of equations  $2x + y = 5, 3x + 2y = 8$  has

A. a unique solution

B. two solutions

C. no solution

D. infinitely many solutions

**Answer: A**



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4. If  $x = -y$  and  $y > 0$ , which of the following is wrong ?

A.  $x^2y > 0$

B.  $x + y = 0$

C.  $xy < 0$

D.  $\frac{1}{x} - \frac{1}{y} = 0$

**Answer: D**



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5. Show that the system of equations

$-x + 2y + 2 = 0$  and  $\frac{1}{2}x - \frac{1}{2}y - 1 = 0$  has a unique solution.



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6. For what values of  $k$  is the system of equations

$$kx + 3y = k - 2$$

$$12x + ky = k$$

inconsistent ?

A.  $k = \pm 6$

B.  $k = -6$  only

C.  $k = 6$  only

D. none of these

**Answer: A**



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7. Show that the equations  $9x - 10y = 21$ ,  $\frac{3x}{2} - \frac{5y}{3} = \frac{7}{2}$  have infinitely many solutions.



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8. Solve graphically :  $x - 2y = 0$ ;  $3x + 4y = 20$



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

A. 30 , 15

B. 36, 12

C. 39, 13

D. none of these

**Answer: C**

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11. Solve :  $23x + 29y = 98$ ,  $29x + 23y = 110$ .

A.  $x = 3, y = 1$

B.  $x = -3, y = 1$

C.  $x = 3, y = -1$

D.  $x = -3, y = -1$

**Answer: A**



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12. Solve :  $6x + 3y = 7xy$  and  $3x + 9y = 11xy$ .

A.  $x = -1, y = \frac{3}{2}$

B.  $x = 1, y = \frac{-3}{2}$

C.  $x = 1, y = \frac{3}{2}$

D.  $x = -1, y = \frac{-3}{2}$

**Answer: C**



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**13.** Find the value of  $k$  for which the system  $kx + 2y = 5$   $3x + y = 1$  has (i) a unique solution, and (ii) no solution.



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**14.** In a  $\triangle ABC$ ,  $\angle C = 3\angle B = 2(\angle A + \angle B)$ . Find the measure of  $\angle C$ .

A.  $20^\circ$

B.  $40^\circ$

C.  $120^\circ$

D. none of these

**Answer: C**

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15. 5 pencils and 7 pens together cost ₹ 195 while 7 pencils and 5 pens together cost ₹ 153. Find the cost of each one of the pencil and the pen.

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16. Solve the following system of equations graphically:

$$2x - 3y = 1, 4x - 3y + 1 = 0.$$

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17. Find  $\angle A$  of a cyclic quadrilateral  $ABCD$  in which  $\angle A = (4x + 20)^\circ$ ,  $\angle B = (3x - 5)^\circ$ ,  $\angle C = (4y)^\circ$  and  $\angle D = (7y + 5)^\circ$

A.  $70^\circ$

B.  $60^\circ$

C.  $120^\circ$

D.  $110^\circ$

**Answer: C**



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**18.**

Solve

for

$$x \text{ and } y: \frac{35}{x+y} + \frac{14}{x-y} = 19, \frac{14}{x+y} + \frac{35}{x-y} = 37.$$



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**19.** A fraction becomes  $\frac{4}{5}$ , if 1 is added to both numerator and denominator. If, however, 5 is subtracted from both numerator and denominator, the fraction becomes . What is the fraction.

A.  $\frac{3}{4}$

B.  $\frac{4}{5}$

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

D.  $\frac{7}{9}$

**Answer: D**



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**20. Solve**

$$\frac{ax}{b} - \frac{by}{a} = a + b$$

$$ax - by = 2ab$$

A.  $x = b, y = a$

B.  $x = -b, y = -a$

C.  $x = b, y = -a$

D.  $x = -b, y = a$

**Answer: C**



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## Question

1. The age of Mr.  $X$  last year was the square of a number and it would be the cube of a number next year. What is the least number of years he must wait for his age to become the cube of a number again?



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2. For what value of  $k$ , do the equation  $2x - 3y + 10 = 0$  and  $3x + ky + 15 = 0$  represent coincident lines



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