



## MATHS

### BOOKS - CAMBRIDGE MATHS (KANNADA ENGLISH)

### PAIR OF LINEAR EQUATION IN TWO VARIABLES

#### 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. Is not this interesting? Represent this situation algebraically and graphically.

[Watch Video Solution](#)

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



[Watch Video Solution](#)

3. The cost of 2kg of apples and 1kg of grapes on a day was found to be Rs 160. After a month the cost of 4kg of apples and 2kg of grapes is Rs300. Represent the situation algebraically and geometrically.



[Watch Video Solution](#)

## Exercise 3 2

1. From the pair of linear equations in the following and 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.



[Watch Video Solution](#)

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

5 pencils and 7 pens 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.



[Watch Video Solution](#)

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:

$$5x - 4y + 8 = 0, 7x + 6y - 9 = 0$$



[Watch Video Solution](#)

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 following pair of linear equations are consistent, or inconsistent.

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



[Watch Video Solution](#)

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 following pair of linear equations are consistent, or inconsistent.

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

 [Watch Video Solution](#)

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.

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

 [Watch Video Solution](#)

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.

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

 [Watch Video Solution](#)

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.

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

 [Watch Video Solution](#)

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.

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

 [Watch Video Solution](#)

10. Which of the following pair of linear equations are consistent/inconsistent? IF consistent, obtain and solution graphically:

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

 [Watch Video Solution](#)

11. Which of the following pair of linear equations are consistent/inconsistent? IF consistent, obtain and solution graphically:

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



[Watch Video Solution](#)

12. Which of the following pair of linear equations are consistent/inconsistent? IF consistent, obtain and solution graphically:

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



[Watch Video Solution](#)

13. Which of the following pair of linear equations are consistent/inconsistent? IF consistent, obtain and solution

graphically:

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



[Watch Video Solution](#)

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



[Watch Video Solution](#)

**15.** 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 :  
intersecting lines



[Watch Video Solution](#)



**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 :

parallel lines

 [Watch Video Solution](#)

**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 :

coincident lines

 [Watch Video Solution](#)

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



Watch Video Solution

### Exercise 3 3

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

$$x + y = 14$$

$$x - y = 4$$



Watch Video Solution

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

$$s - t = 3$$

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



Watch Video Solution

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

$$3x - y = 3$$

$$9x - 3y = 9$$

 [Watch Video Solution](#)

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

$$0.2x + 0.3y = 1.3 \text{ and } 0.4x + 0.5y = 2.3$$

 [Watch Video Solution](#)

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

$$x + y = 14$$

$$x - y = 4$$

 [Watch Video Solution](#)

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

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

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

 [Watch Video Solution](#)

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

 [Watch Video Solution](#)

**8.** From 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.

 [Watch Video Solution](#)

**9.** From the pair of linear equations for the following problems and find their solutions by substitution method.

The largest of two supplementary angle exceeds the smaller by 18 degrees. Find them.

 [Watch Video Solution](#)

**10.** From the pair of linear equations for the following problems and find their solutions by substitution method.

The coach of cricket team buys 7bats and 6balls and Rs 3800. Later,

she buys 3 bats and 5 balls for Rs 1750. Find the cost of each bat and each ball.

 [Watch Video Solution](#)

**11.** From the pair of linear equations for the following problems and find their solutions by substitution method.

The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10km the charge paid is Rs 105 and for a journey of 15km, the charge paid is Rs 155. What are the fixed charge and the charge per km? How much does a person have to pay for travelling a distance of 25km.

 [Watch Video Solution](#)

**12.** From the pair of linear equations for the following problems and find their solutions 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.

 [Watch Video Solution](#)

**13.** From the pair of linear equations for the following problems and find their solutions by substitution method.

Five years hence the age of Jacob will be three times that of his son. Five years ago , Jacob age was seven times that of his son.

What are their present ages.

 [Watch Video Solution](#)

Exercise 3 4

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

$$x + y = 5 \text{ and } 2x - 3y = 4$$



[Watch Video Solution](#)

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

$$3x + 4y = 10 \text{ and } 2x - 2y = 2$$



[Watch Video Solution](#)

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

$$3x - 5y - 4 = 0 \text{ and } 9x = 2y + 7$$



[Watch Video Solution](#)



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

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

 [Watch Video Solution](#)

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

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

 [Watch Video Solution](#)

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

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 ?



[Watch Video Solution](#)

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

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.



[Watch Video Solution](#)

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

Meena went to a bank to withdraw Rs. 2000. 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.



[Watch Video Solution](#)

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

A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Sarita 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.



[Watch Video Solution](#)

### Exercise 3 5

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

$$x - 3y - 3 = 0 \text{ and } 3x - 9y - 2 = 0$$

 [Watch Video Solution](#)

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

$$2x + y = 5 \text{ and } 3x, 2y = 8$$

 [Watch Video Solution](#)

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

$$x - 3y - 7 = 0 \text{ and } 3x - 3y - 15 = 0$$

[Watch Video Solution](#)

4. For which values of  $a$  and  $b$  does the following pair of linear equations have an infinite number of solutions ?

$$2x + 3y = 7$$

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

[Watch Video Solution](#)

5. Find the value of  $k$ , if the pair of linear equations  $2x - 3y = 8$  and  $2(k - 4)x - ky = k + 3$



[Watch Video Solution](#)

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

$$x + y = 14$$

$$x - y = 4$$



[Watch Video Solution](#)

7. Form the pair of linear equations in the following problems and find their solutions (if they exist) by any algebraic method :

A part of monthly hostel charges is fixed and the remaining depends on the number of days on has taken food in the mess.

When a student A takes food for 20 days she has to pay Rs. 1000 as hostel charges whereas a student B, who takes food for 26 days, Rs. 1180 as hostel charges. find the fixed charges and the cost of food per day.



[Watch Video Solution](#)

**8.** Form the pair of linear equations in the following problems and find their solutions (if they exist) by any algebraic method :

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.



[Watch Video Solution](#)

**9.** Form the pair of linear equations in the following problems and find their solutions (if they exist) by any algebraic method :

Yash scored 40 marks in 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 ?

 [Watch Video Solution](#)

**10.** Form the pair of linear equations in the following problems and find their solutions (if they exist) by any algebraic method :

Places A and B are 100 km apart on 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 ?

 [Watch Video Solution](#)



**11.** Form the pair of linear equations in the following problems and find their solutions (if they exist) by any algebraic method :

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 increases the length by 3 unit and the breadth by 2 units, the area increases by 67 square units. Find the dimensions of the rectangle.

 [Watch Video Solution](#)

### Exercise 3 6

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

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

 [Watch Video Solution](#)

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

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

 [Watch Video Solution](#)

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

$$\frac{4}{x} + 3y = 14 \text{ and } 3y = 14 \text{ and } \frac{3}{x} - 4y = 23$$

 [Watch Video Solution](#)

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

$$\frac{5}{x-1} + \frac{1}{y-2} = 2 \text{ and } \frac{6}{x-1} - \frac{3}{y-2} = 1$$

 [Watch Video Solution](#)

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

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



[Watch Video Solution](#)

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

$$6x + 3y = 6xy \text{ and } 2x + 4y = 5xy$$



[Watch Video Solution](#)

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

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



 [Watch Video Solution](#)

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

$$\frac{1}{3x + y} + \frac{1}{3x - y} = \frac{3}{4} \quad \text{and} \quad \frac{1}{2(3x + y)} - \frac{1}{2(3x - y)} = \frac{-1}{8}$$

 [Watch Video Solution](#)

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 4 km in 2 hours. Find her speed of rowing in still water and the speed of the current.

 [Watch Video Solution](#)

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



[Watch Video Solution](#)

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

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



[Watch Video Solution](#)

 [Watch Video Solution](#)

### 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.

 [Watch Video Solution](#)

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? [From the Bijaganita of Bhoaskara II].

 [Watch Video Solution](#)

3. A train covered a certain distance at a uniform speed. If the train would have been 10 km/hr faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 km/hr, it would have taken 3 hours more than the scheduled time. Find the distance covered by train.



[Watch Video Solution](#)

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.



[Watch Video Solution](#)

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

 [Watch Video Solution](#)

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.

 [Watch Video Solution](#)

7. Solve the following pair of linear equations :

$$px + qy = p - q \text{ and } qx - py = p + q$$

 [Watch Video Solution](#)

8. Solve the following pair of linear equations :

$$ax + by = c \text{ and } bx + ay = 1 + c$$

 [Watch Video Solution](#)



9. Solve the following pair of linear equations :

$$\frac{x}{a} - \frac{y}{b} = 0 \text{ and } ax + by = a^2 + b^2$$



Watch Video Solution

10. Solve the following pair of linear equations :

$$(a - b)x + (a + b)y = a^2 - 2ab - b^2 \text{ and } (a + b)(x + y) = a^3 + b^2$$



Watch Video Solution

11. Solve the following pair of linear equations :

$$152x - 378y = -74 \text{ and } -378x + 152y = -604$$



Watch Video Solution

12. ABCD is a cyclic quadrilateral. Find the angles of the cyclic quadrilateral.



[Watch Video Solution](#)