



# MATHS

## NCERT - NCERT Maths(Telugu)

### LINEAR EQUATIONS IN TWO VARIABLES

#### Examples

1. Sachin and Sehwag scored 137 runs together. Express the information in the form

of an equation.



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2. Hema's age is 4 times the age of Mary. Write a linear equation in two variables to represent this information.



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3. A number is 27 more than the number obtained by reversing its digits. If its unit's and

ten's digits are  $x$  and  $y$  respectively, write the linear equation representing the above statement.



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4. Express each of the following equations in the form of  $ax + by + c = 0$  and write the values of  $a$ ,  $b$  and  $c$ .

(i)  $3x + 4y = 5$  (ii)  $x - 5 = \sqrt{3}y$

(iii)  $3x = y$  (iv)  $\frac{x}{2} + \frac{y}{2} = \frac{1}{6}$

(v)  $3x - 7 = 0$



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5. Write each of the following in the form of  $ax$

$+ by + c = 0$  and find the values of  $a$ ,  $b$  and  $c$

(i)  $x = -5$

(ii)  $y = 2$

(iii)  $2x = 3$

(iv)  $5y = -3$



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6. Find four different solutions of  $4x + y = 9$ .

(Complete the table wherever necessary)



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7. Check which of the following are solutions of an equation  $x + 2y = 4$ ? (Complete the table wherever necessary)

(i) (0, 2) (ii) (2, 0) (iii) (4, 0) (iv)  $(\sqrt{2}, -\sqrt{2})$

(v) (1, 1) (vi) (-2, 3)



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8. If  $x = 3$ ,  $y = 2$  is a solution of the equation  $5x - 7y = k$ , find the value of  $k$  and write the resultant equation.



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9. If  $x = 2k + 1$  and  $y = k$  is a solutions of the equation  $5x + 3y - 7 = 0$ , find the value of  $k$ .



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**10.** Draw the graph of the equation  $x - 2y = 3$ .

From the graph find (i) The solution  $(x, y)$

where  $x = -5$

(ii) The solution  $(x, y)$  where  $y = 0$

(iii) The solution  $(x, y)$  where  $x = 0$



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**11.** For each graph given below, four linear equations are given. Out of these find the equation that represents the given graph.

(i) Equations are

(A)  $y = x$

(B)  $x + y = 0$

(C)  $y = 2x$

(D)  $2 + 3y = 7x$

(ii) Equations are

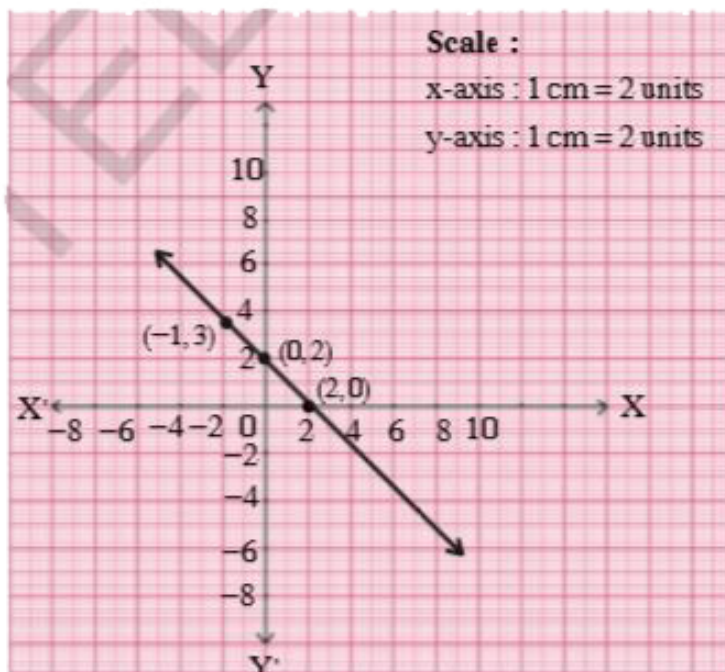
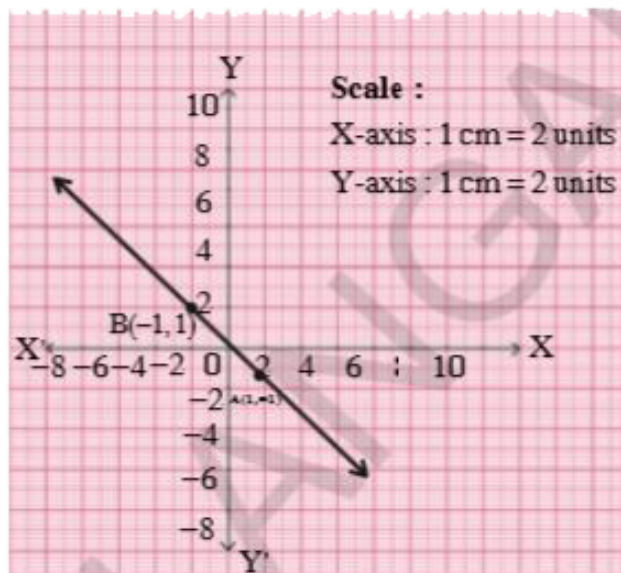
(A)  $y = x + 2$

(B)  $y = x - 2$

(C)  $y = -x + 2$



(D)  $x + 2y = 6$





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Try This

1. Express the following linear equations in the form of  $ax + by + c = 0$  and indicate the values of  $a, b, c$  in each case?

(i)  $3x + 2y = 9$  (ii)  $-2x + 3y = 6$  (iii)  $9x - 5y = 10$

(iv)  $\frac{x}{2} - \frac{y}{2} - 5 = 0$  (v)  $2x = y$



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2. Find 5 solutions for the equation  $3x-2y=5$



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3. Take a graph paper, plot the point  $(2, 4)$ , and draw a line passing through it. Now answer the following questions.

How many such lines can be drawn?



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4. Take a graph paper, plot the point  $(2, 4)$ , and draw a line passing through it. Now answer the following questions.

How many linear equations in two variables exist for which  $(2, 4)$  is a solution?



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**Do This**

1. Draw the graph of following equations :  $x =$

2.



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2. (i) Draw the graph of the following equations

(a)  $y = 2$  (b)  $y = -2$  (c)  $y = 3$  (d)  $y = -3$

(ii) Are all these parallel to the X-axis?

(iii) Find the distance between the graph of the line and the X-axis in each case





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## Exercise 8 1

1. Express the following linear equation in the form of  $ax+by+c=0$  and indicate the values of  $a$ ,  $b$  and  $c$  in each case.

(i)  $8x + 5y - 3 = 0$  (ii)  $28x - 35y = -7$  (iii)  $93x = 12 -$

$15y$

(iv)  $2x = -5y$  (v)  $\frac{x}{3} + \frac{y}{4} = 7$  (vi)  $y = \frac{-3}{2}x$

(vii)  $3x+5y=12$



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2. Write each of the following in the form of  $ax + by + c = 0$  and find the values of  $a$ ,  $b$  and  $c$

(i)  $2x = 5$  (ii)  $y - 2 = 0$  (iii)  $\frac{y}{7} = 3$  (iv)  $x = \frac{-14}{13}$



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3. Express the following statements as a linear equation in two variables.

The sum of two numbers is 34.



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4. Express the following statements as a linear equation in two variables.

The cost of a ball pen is 5 less than half the cost of a fountain pen.



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5. Express the following statements as a linear equation in two variables.

Bhargavi got 10 more marks than double the marks of Sindhu.





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6. Express the following statements as a linear equation in two variables.

The cost of a pencil is 2 and a ball point pen is 15. Sheela pays 100 for the pencils and pens she purchased.



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7. Express the following statements as a linear equation in two variables.

Yamini and Fatima of class IX together contributed ₹ 200/- towards the Prime Minister's Relief Fund.



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8. Express the following statements as a linear equation in two variables.

The sum of a two digit number and the

number obtained by reversing the order of its digits is 121. If the digits in unit's and ten's place are 'x' and 'y' respectively.



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## Exercise 8 2

1. Find three different solutions of the each of the following equations.

(i)  $3x + 4y = 7$  (ii)  $y = 6x$  (iii)  $2x - y = 7$

(iv)  $13x - 12y = 25$  (v)  $10x + 11y = 21$  (vi)  $x + y = 0$



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2. If  $(0, a)$  and  $(b, 0)$  are the solutions of the following linear equations. Find 'a' and 'b'.

(i)  $8x - y = 34$  (ii)  $3x = 7y - 21$  (iii)  $5x - 2y + 3 = 0$



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3. Check which of the following is solution of the equation  $2x - 5y = 10$

(i)  $(0, 2)$  (ii)  $(0, -2)$  (iii)  $(5, 0)$  (iv)  $(2\sqrt{3}, -\sqrt{3})$

(v)  $(\frac{1}{2}, 2)$



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4. Find the value of  $k$ , if  $x = 2$ ,  $y = 1$  is a solution of the equation  $2x + 3y = k$ . Find two more solutions of the resultant equation.



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5. If  $x = 2 - \alpha$  and  $y = 2 + \alpha$  is a solution of the equation  $3x - 2y + 6 = 0$  find the value of ' $\alpha$ '.

Find three more solutions of the resultant equation.



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6. Write five different linear equations in two variables and find three solutions for each of them?



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1. Draw the graph of each of the following linear equations :  $-x + y = 6$ .



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2. Draw the graph of each of the following linear equations and answer the following question :  $y = x$ .



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3. Draw the graph of the equation  $2x + 3y = 11$ .

From the graph find the value of  $y$  when  $x = 1$ .



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4. Draw the graph of the equation  $y - x = 2$ .

Find from the graph

(i) the value of  $y$  when  $x = 4$

(ii) the value of  $x$  when  $y = -3$



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5. Draw the graph of the equation  $2x + 3y = 12$ .

From the graph find the coordinates of the point : Whose y-coordinate is 3.



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6. Draw the graph of each of the equations given below and also find the coordinates of the points where the graph cuts the coordinate axes

(i)  $6x - 3y = 12$  (ii)  $-x + 4y = 8$  (iii)  $3x + 2y + 6 = 0$



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7. Rajiya and Preethi two students of Class IX together collected 1000 for the Prime Minister Relief Fund for victims of natural calamities. Write a linear equation and draw a graph to depict the statement.



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8. Gopaiah sowed wheat and paddy in two fields of total area 5000 square meters. Write

a linear equation and draw a graph to represent the same?



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9. The force applied on a body of mass 6 kg. is directly proportional to the acceleration produced in the body. Write an equation to express this observation and draw the graph of the equation.



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10. A stone is falling from a mountain. The velocity of the stone is given by  $v = 9.8t$ . Draw its graph and find the velocity of the stone 4 seconds after start.



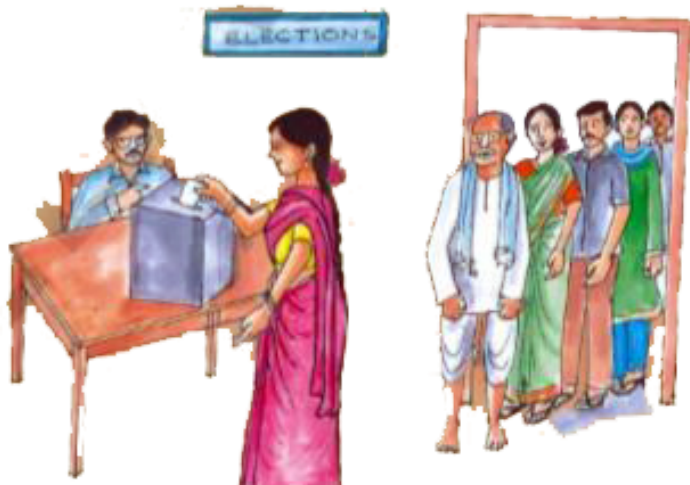
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## Exercise 8 4

1. In an election 60% of voters cast their votes. Form an equation and draw the graph for this data. Find the following from the graph.

(i) The total number of voters, if 1200 voters cast their votes

(ii) The number votes cast, if the total number of voters are 800



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2. When Rupa was born, her father was 25 years old. From the equation draw a graph for this data. From the graph read : The age of the father when Rupa is 25 years old.



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3. An auto charges 15 for first kilometer and 8 each for each subsequent kilometer. For a distance of 'x' km. an amount of 'y' is paid.

Write the linear equation representing this

information and draw the graph. With the help of graph find the distance travelled if the fare paid is 55? How much would have to be paid for 7 kilometers?



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4. A lending library has fixed charge for the first three days and an additional charges for each day thereafter. John paid 27 for a book kept for seven days. If the fixed charges be  $x$  and subsequent per day charges be  $y$ , then

write the linear equation representing the above information and draw the graph of the same. From the graph, find fixed charges for the first three if additional charges for each day thereafter is 4. Find additional charges for each day thereafter if the fixed charges for the first three days of 7.



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5. The parking charges of a car in Hyderabad Railway station for first two hours is 50 and 10



for each subsequent hour. Write down an equation and draw the graph. Find the following charges from the graph

(i) For three hours (ii) For six hours

(iii) How many hours did Rekha park her car if she paid 80 as parking charges?



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**6.** Sameera was driving a car with uniform speed of 60 kmph. Draw distance-time graph. From the graph find the distance travelled by

Sameera in

(i)  $(1) \frac{1}{2}$  hours (ii) 2 hours (iii)  $(3) \frac{1}{2}$  hours



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7. The ratio of molecular weight of Hydrogen and Oxygen in water is 1:8. Set up an equation between Hydrogen and Oxygen and draw its graph. From the graph find the quantity of Hydrogen if Oxygen is 12 grams. And quantity of oxygen if hydrogen is  $\frac{3}{2}$  gms.?



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**8.** In a mixture of 28 litres, the ratio of milk and water is  $5:2$  , set up the equation between the mixture and milk. Draw its graph. By observing the graph, find the quantity of milk in the mixture.



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**9.** In countries like USA and Canada temperature is measured in Fahrenheit whereas in countries like India, it is measured in

Celsius. Here is a linear equation that converts

$$\text{Fahrenheit to Celsius } F = \left(\frac{9}{5}\right)C + 32$$

If the temperature is  $95^{\circ}\text{F}$ , what is the temperature in Celsius?



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**10.** In countries like USA and Canada temperature is measured in Fahrenheit where as in countries like India, it is measured in Celsius. Here is a linear equation that converts

$$\text{Fahrenheit to Celsius } F = \left(\frac{9}{5}\right)C + 32$$

If the temperature is  $30^{\circ}\text{C}$ , what is the temperature in Fahrenheit?



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11. In countries like USA and Canada temperature is measured in Fahrenheit where as in countries like India, it is measured in Celsius. Here is a linear equation that converts Fahrenheit to Celsius  $F = \left(\frac{9}{5}\right)C + 32$

If the temperature is  $95^{\circ}\text{F}$ , what is the temperature in Celsius?



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12. In countries like USA and Canada temperature is measured in Fahrenheit where as in countries like India, it is measured in Celsius. Here is a linear equation that converts

$$\text{Fahrenheit to Celsius } F = \left(\frac{9}{5}\right)C + 32$$

Is there a temperature that has numerically the same value in both Fahrenheit and Celsius? If yes find it?



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## Exercise 8 5

1. Give the graphical representation of the following equation.

(a) On the number line and (b) On the Cartesian plane

(i)  $x = 3$  (ii)  $y + 3 = 0$  (iii)  $y = 4$  (iv)  $2x - 9 = 0$

(v)  $3x + 5 = 0$



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2. Give the graphical representation of  $2x - 11 =$

0 as an equation in

(i) one variable (ii) two variables



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3. Solve the equation  $3x + 2 = 8x - 8$  and

represent the solution on number line and the

Cartesian plane.



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4. Write the equation of the line parallel to X-axis, and passing through the point

(i)  $(0, -3)$  (ii)  $(0, 4)$  (iii)  $(2, -5)$  (iv)  $(3, 4)$



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5. Write the equation of the line parallel to Y-axis and passing through the point

(i)  $(-4, 0)$  (ii)  $(2, 0)$  (iii)  $(3, 5)$  (iv)  $(-4, -3)$



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**6.** Write the equation of three lines that are

(i) parallel to the X-axis (ii) parallel to the Y-

axis



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