MATHS

NCERT - NCERT MATHEMATICS(ENGLISH)

LINEAR EQUATIONS IN TWO VARIABLES

Exercise 4 3

1. The taxi fare in a city is as follows: For the first kilometre, the fare is Rs 8 and for the subsequent distance it is Rs 5 per km. Taking the distance covered as x km and total fare as Rs y, write a linear equation for this information, and draw its graph.

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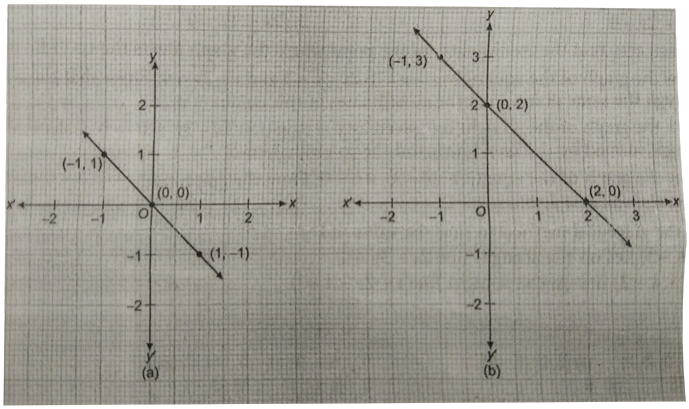
2. From the choices given below choose the equation whose graphs are given in fig (a) and

fig(b)



For fig (a)

(i) $y = x$ (ii) $x + y = 0$

(iii) $y = 2x$ (iv) $2 + 3y = 7x$

For fig (b)

(i) $y = x + 2$ (ii) $y = x - 2$

(iii) $y = -x + 2$ (iv) `x+2

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3. If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body, express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as 5 units. Also read from the graph the work done when the distance travelled by the body is (i) 2 units (ii) 0 unit.

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4. Yamini and Fatima, two students of Class IX of a school, together contributed Rs 100towards the Prime Minister's Relief Fund to help the earthquake victims. Write a linear equation which satisfies this data. (You may take their contributions as Rs x and Rs y.) Draw the graph of the same.

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5. Draw the graph of each of the following linear equations in two variables:

(i) $x + y = 4$ (ii) $x - y = 2$

(iii) $y = 3x$ (iv) $3 = 2x + y$

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6. Give the equations of two lines passing through (2, 14). How many more such lines are there, and why?

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7. If the point $(3, 4)$ lies on the graph of the equation $3y = ax + 7$, find the value of a.

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8. In countries like USA and Canada, temperature is measured in Fahrenheit, whereas incountries like India, it is measured in Celsius. Here is a linear equation that convertsFahrenheit to Celsius:

$F = \left(\frac{9}{5}\right)C + 32$(i) Draw the graph of the linear equation.

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Exercise 4 2

1. Find the value of k, if $x = 2, y = 1$is a solution of the equations $2x + 3y = k$.

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2. Check which of the following are solutions of the equations $x - 2y = 4$and which are not:

(i) $(0, 2)$ (ii) $(2, 0)$ (iii) $(4, 0)$

(iv) $\left(\sqrt{2}, 4\sqrt{2}\right)$ (v) $(1,\ 1)$

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3. Write four solutions for each of the following equations:

(i) $2x + y = 7$

(ii) $\pi x + y = 9$

(iii) $x = 4y$

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4. Which one of the following options is true, and why? $y = 3x + 5$has

(i) a unique solution,

(ii) only two solutions,

(iii) infinitely many solutions

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Solved Examples

1. Solve the equation $2x + 1 = x - 3$and represent the solution(s)on (i) the number line(ii) the Cartesian plane.

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2. Given the point (1, 2), find the equation of a line on which it lies. How many such equations are there?

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3. Find two solutions for each of the following equations:(i) $4x + 3y = 12$ (ii) $2x + 5y = 0$ (iii) $3y + 4 = 0$

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4. The force exerted to pull a cart is directly proportional to the acceleration produced in the body. Express the statement as a linear equation of two variables and draw the graph

of the same by taking the constant mass equal to 6 kg. Read from the graph, the force required when the acceleration produced is

$(i) 5ms^{-2}$ $(ii) 6ms^{-2}$

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5. Draw the graph of $x + y = 7$.

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6. Write each of the following equations in the form $ax + by + c = 0$and indicate the values of a, b and c in each case:(i) $2x + 3y = 4.37$ (ii) $x - 4 = \sqrt{3}y$ (iii)$4 = 5x - 3y$ (iv) $2x = y$

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7. Find four different solutions of the equation $x + 2y = 6.$

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8. Write each of the following as an equation in two variables:(i) $x = -5$ (ii) $y = 2$ (iii) $2x = 3$ (iv) $5y = 2$

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9. For each of the graphs given in Fig. 4.5 select the equation whose graph it is from the choices given below:(a) For Fig 4.5(i)(i) $x + y = 0$ (ii) $y = 2x$ (iii) $y = x$ (iv) $y = 2x + 1$(b) For fig 4,5(ii)(i) $x + y = 0$ (ii) y = 2x (iii) y = 2x + 4 (iv) y = x - 4

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Exercise 4 4

1. Give the geometric representations of $y = 3$

as an equation

(i) in one variable

(ii) in two variables

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2. Give the geometric representations of $2x + 9 = 0$ as an equation

(i) in one variable

(ii) in two variables

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Exercise 4 1

1. Express the following linear equations in the form $ax + by + c = 0$and indicate the values

of a, b and c in each case:

(i) $2x + 3y = 9.\overline{35}$

(ii) $x - \frac{y}{5} - 10 = 0$

(iii) $-2x + 3y = 6$

(iv) $x = 3y$

(v) $2x = -5y$

(vi) $3x + 2 = 0$

(vii) $y - 2 = 0$

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2. The cost of a notebook is twice the cost of a pen. Write a linear equation in two variables to represent this statement.(Take the cost of a notebook to be Rs x and that of a pen to be Rs y).