# CLASS IX: CHAPTER – 4
# LINEAR EQUATION IN TWO VARIABLES

**1.** The solution of the equation $x - 2y = 4$ is:
(a) (0, 2) (b) (4, 0) (c) (1, 1) (d) (2, 0)

**2.** In graphical representation of $y = -4$, line is:
(a) parallel to x – axis (b) parallel to y – axis
(c) passes through origin (d) None of these.

**3.** Solution of the equation $2x + 1 = x + 3$ is:
(a) 3 (b) 1 (c) 2 (d) 4

**4.** The graph of line $x - y = 0$ passes through:
(a) (2, 3) (b) (3, 4) (c) (5, 6) (d) (0, 0)

**5.** The graph of line $x + y = 7$ intersect the x-axis at:
(a) (7, 0) (b) (0, 7) (c) (–7, 0) (d) (0, –7)

**6.** Point (4, 1) lies on the line:
(a) $x + 2y = 5$ (b) $x + 2y = -6$ (c) $x + 2y = 6$ (d) $x + 2y = 16$

**7.** Graph of $x = 2$ is a line:
(a) parallel to x – axis (b) parallel to y – axis
(c) passes through origin (d) None of these.

**8.** The linear equation $2x - 5y = 7$ has
(a) a unique solution (b) two solutions
(c) infinitely many solutions (d) no solutions.

**9.** The equation $2x + 5y = 7$ has a unique solution, if x, y are:
(a) natural numbers (b) positive numbers
(c) real numbers (d) rational numbers.

**10.** If (2, 0) is a solution of the linear equation $2x + 3y = k$, then the value of k is
(a) 4 (b) 6 (c) 5 (d) 2

**11.** Any solution of the linear equation $2x + 0y + 9 = 0$ in two variables is of the form
(a) $(-\frac{9}{2}, m)$ (b) $(n, -\frac{9}{2})$ (c) $(0, -\frac{9}{2})$ (d) (–9, 0)

**12.** The graph of the linear equation $2x + 3y = 6$ cuts the y-axis at the point
(a) (2, 0) (b) (0, 3) (c) (3, 0) (d) (0, 2)

**13.** The equation $x = 7$, in two variables, can be written as
(a) $x + 0y = 7$ (b) $0x + y = 7$ (c) $0x + 0y = 7$ (d) $x + y = 7$

**14.** Any point on the x – axis is of the form
(a) (x, y) (b) (0, y) (c) (x, 0) (d) (x, x)

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**1.** Any point on the $y = x$ is of the form
(a) (a, a) (b) (0, a) (c) (a, 0) (d) (a, –a)

**2.** The equation of x –axis is of the form
(a) $x = 0$ (b) $y = 0$ (c) $x + y = 0$ (d) $x = y$

**3.** Graph of $y = 6$ is a line:
(a) parallel to x – axis at a distance 6 units from the origin
(b) parallel to y – axis at a distance 6 units from the origin
(c) making an intercept 6 on the x –axis.
(d) making an intercept 6 on both the axes.

**4.** x=5, y=2 is a solution of the linear equation
(a) $x + 2y = 7$ (b) $5x + 2y = 7$ (c) $x + y = 7$ (d) $5x + y = 7$

**5.** If a linear equation has solutions (–2, 2), (0, 0) and (2, –2), then its is of the form
(a) $y - x = 0$ (b) $x + y = 0$ (c) $-2x + y = 0$ (d) $-x + 2y = 0$

**6.** The positive solutions of the equation is $ax + by + c = 0$ always lie in the
(a) 1st quadrant (b) 2nd quadrant (c) 3rd quadrant (d)4th quadrant

**7.** The graph of the linear equation $2x + 3y = 6$ is a line which meets the x axis at the point
(a) (2, 0) (b) (0, 3) (c) (3, 0) (d) (0, 2)

**8.** The graph of the $y = x$ passes through the point
(a) $\left(\frac{3}{2}, -\frac{3}{2}\right)$ (b) $\left(0, \frac{3}{2}\right)$ (c) (1, 1) (d) $\left(\frac{-1}{2}, \frac{1}{2}\right)$

**9.** If we multiply or divide both sides of a linear equation with a non-zero number, then the solution of the linear equation:
(a) changes (b) remains the same
(c) changes in case of multiplication only (d) changes in case of division only

**10.** How many linear equation in x and y can be satisfied by $x = 1$ and $y = 2$?
(a) only one (b) two (c) infinitely many (d) three

**11.** The point of the form (a, a) always lies on:
(a) x – axis (b) y – axis (c) on the line $y = x$ (d) on the $x + y = 0$

**12.** The point of the form (a, –a) always lies on:
(a) $x = a$ (b) $y = -a$ (c) $y = x$ (d) $x + y = 0$

# CLASS IX: CHAPTER – 4
# LINEAR EQUATION IN TWO VARIABLES

**1.** Which of the following is not a linear equation in two variables?
(a) $ax + by = c$ (b) $ax^2 + by = c$ (c) $2x + 3y = 5$ (d) $3x + 2y = 6$

**2.** The graph of $ax + by + c = 0$ is
(a) a straight line parallel to x–axis (b) a straight line parallel to y–axis
(c) a general straight line (d) a line in the 2nd and 3rd quadant

**3.** The solution of a linear equation in two variables is
(a) a number which satisfies the given equation
(b) an ordered pair which satisfies the given equation
(c) an ordered pair, whose respective values when substituted for x and y in the given equation, satisfies it
(d) none of these

**4.** One of the solution of a linear equation in two variables is
(a) (3, 2) (b) (3, –2) (c) (2, 3) (d) (–2, –3)

**5.** The ordered pair (m, n) satisfies the equation $ax + by + c = 0$ if
(a) $am + bn = 0$ (b) $c = 0$ (c) $am + bn + c = 0$ (d) $am + bn - c = 0$

**6.** The equation of x – axis is
(a) $a = 0$ (b) $y = 0$ (c) $x = 0$ (d) $y = k$

**7.** From the graph of a line, we can find the coordinates of
(a) only two point lying on the line
(b) only two points only lying on the line.
(c) only finite number of points lying on the line.
(d) only infinite number of points lying on the line.

**8.** A linear equation in two variables has
(a) no solution (b) only one solution (c) only two solutions (d) infinitely many solutions

**9.** An equation of the form $ax + by + c = 0$ represents a linear equation in two variables, if
(a) $a = 0, b \neq 0$ (b) $a \neq 0, b = 0$ (c) $a = 0, b = 0$ (d) $a = 0, b \neq 0$

**10.** The graph of the linear equation in two variables $y = mx$ is
(a) a line parallel to x – axis (b) a line parallel to y – axis
(c) a line passing through the origin (d) not a straight line

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

**2.** Find the points where the graph of the equation $3x + 4y = 12$ cuts the $x$-axis and the $y$-axis.

**3.** At what point does the graph of the linear equation $x + y = 5$ meet a line which is parallel to the $y$-axis, at a distance 2 units from the origin and in the positive direction of $x$-axis.

**4.** Determine the point on the graph of the equation $2x + 5y = 20$ whose $x$-coordinate is $\frac{5}{2}$ times its ordinate.

**5.** Draw the graph of the equation represented by the straight line which is parallel to the $x$-axis and is 4 units above it.

**6.** Draw the graphs of linear equations $y = x$ and $y = -x$ on the same cartesian plane. What do you observe?

**7.** Determine the point on the graph of the linear equation $2x + 5y = 19$, whose ordinate is $1\frac{1}{2}$ times its abscissa.

**8.** Draw the graph of the equation represented by a straight line which is parallel to the $x$-axis and at a distance 3 units below it.

**9.** Draw the graph of the linear equation whose solutions are represented by the points having the sum of the coordinates as 10 units.

**10.** Write the linear equation such that each point on its graph has an ordinate 3 times its abscissa.

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

**12.** How many solution(s) of the equation $2x + 1 = x - 3$ are there on the : (i) Number line (ii) Cartesian plane

**13.** Find the solution of the linear equation $x + 2y = 8$ which represents a point on (i) $x$-axis (ii) $y$-axis

**14.** For what value of $c$, the linear equation $2x + cy = 8$ has equal values of $x$ and $y$ for its solution.

**15.** Let $y$ varies directly as $x$. If $y = 12$ when $x = 4$, then write a linear equation. What is the value of $y$ when $x = 5$?

**16.** Draw the graph of the linear equation $2x + 3y = 12$. At what points, the graph of the equation cuts the $x$-axis and the $y$-axis?

**17.** Show that the points A (1, 2), B (– 1, – 16) and C (0, – 7) lie on the graph of the linear equation $y = 9x - 7$.

**18.** The following values of $x$ and $y$ are thought to satisfy a linear equation :

| | | |
|---|---|---|
| **x** | 1 | 2 |
| **y** | 1 | 3 |

Draw the graph, using the values of $x$, $y$ as given in the above table. At what point the graph of the linear equation (i) cuts the $x$-axis. (ii) cuts the $y$-axis.

**19.** The Autorikshaw fare in a city is charged Rs 10 for the first kilometer and @ Rs 4 per kilometer for subsequent distance covered. Write the linear equation to express the above statement. Draw the graph of the linear equation.

**20.** The work done by a body on application of a constant force is the product of the constant force and the distance travelled by the body in the direction of force. Express this in the form of a linear equation in two variables and draw its graph by taking the constant force as 3 units. What is the work done when the distance travelled is 2 units. Verify it by plotting the graph.

**21.** The following values of $x$ and $y$ are thought to satisfy a linear equation, Write the linear equation.

| | | |
|---|---|---|
| **x** | 6 | –6 |
| **y** | –6 | 6 |

Draw the graph, using the values of $x$, $y$ as given in the above table. At what point the graph of the linear equation (i) cuts the $x$-axis. (ii) cuts the $y$-axis.

**22.** Draw the graph of the linear equation $3x + 4y = 6$. At what points, the graph cuts the $x$-axis and the $y$-axis.

**23.** 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) 5 m/sec$^2$, (ii) 6 m/sec$^2$.

**24.** If the temperature of a liquid can be measured in Kelvin units as $x$°K or in Fahrenheit units as $y$°F, the relation between the two systems of measurement of temperature is given by the linear equation $y = \frac{9}{5}(x - 273) + 32$

(i) Find the temperature of the liquid in Fahrenheit if the temperature of the liquid is 313°K.
(ii) If the temperature is 158° F, then find the temperature in Kelvin.

**25.** The linear equation that converts Fahrenheit (F) to Celsius (C) is given by the relation

$$C = \frac{5F - 160}{9}$$

(i) If the temperature is 86°F, what is the temperature in Celsius?
(ii) If the temperature is 35°C, what is the temperature in Fahrenheit?
(iii) If the temperature is 0°C what is the temperature in Fahrenheit and if the temperature is 0°F, what is the temperature in Celsius?
(iv) What is the numerical value of the temperature which is same in both the scales?

**26.** Draw the graph of $x + y = 7$ and $x - y = 2$ on the same graph.

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

**28.** 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.

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

**30.** Give the geometric representations of $y = 3$ as an equation
(i) in one variable (ii) in two variables

**31.** Give the geometric representations of $2x + 9 = 0$ as an equation
(i) in one variable (ii) in two variables

**32.** The force applied on a body is directly proportional to the acceleration produced in the body. Write an equation to express this situation and plot the graph of the equation.

**33.** 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.

**34.** Draw the graphs of the equations y = x and $y = -x$ in the same graph paper. Find the coordinates of the point where two lines intersect.

**35.** Draw the graphs of the equations $3x - 2y = 4$ and $x + y - 3 = 0$ in the same graph paper. Find the coordinates of the point where two lines intersect.

**36.** Draw the graphs of the equations $3x - 2y + 6 = 0$ and $x + 2y - 6 = 0$ in the same graph paper. Find the area of triangle formed by the two lines and x – axis.

**37.** If the number of hours for which a labourer works is x and y are his wages (in rupees) and y = 2x – 1, draw the graph of work – wages equation. From the graph, find the wages of the labourer if he works for 6 hours.

**38.** A and B are friends. A is elder to B by 5 years. B's sister C is half the age of B while A's father D is 8 years older than twice the age of B. If the present age of D is 48 years, find the present ages of A, B and C.

**39.** A three-wheeler scoter charges Rs. 10 for the first km and Rs. 4.50 each for every subsequent km. For a distance of x km, an amount of Rs. Y is paid. Write the linear equation representing the above information.

**40.** Solve: $5x + \frac{7}{2} = \frac{3}{2}x - 14$

**41.** Solve: $\frac{6x+1}{3} + 1 = \frac{x-3}{6}$

**42.** Solve: $5x - 2(2x - 7) = 2(3x - 1) + \frac{7}{2}$

**43.** Solve: $\frac{3x-2}{4} - \frac{2x+3}{3} = \frac{2}{3} - x$

**44.** Solve: $\frac{3x+2}{7} + \frac{4(x+1)}{5} = \frac{2}{3}(2x+1)$

**45.** Solve: $x-\frac{x-1}{2}=1-\frac{x-2}{3}$

**46.** Solve: $\frac{x}{2}-\frac{1}{5}=\frac{x}{3}+\frac{1}{4}$

**47.** Solve: $\frac{x}{2}-\frac{3x}{4}+\frac{5x}{6}=21$

**48.** Solve: $x+7-\frac{8x}{3}=\frac{17}{6}-\frac{5x}{2}$

**49.** Solve: $\frac{3x+4}{2-6x}=\frac{-2}{5}$

**50.** Solve: $\frac{7x+4}{x+2}=\frac{-4}{3}$

**51.** The ages of Rahul and Haroon are in the ratio 5:7. Four years later the sum of their ages will be 56 years. What are their present ages?

**52.** Baichung's father is 26 years younger than Baichung's grandfather and 29 years older than Baichung. The sum of the ages of all the three is 135 years. What is the age of each one of them?

**53.** Lakshmi is a cashier in a bank. She has currency notes of denominations Rs 100, Rs 50 and Rs 10, respectively. The ratio of the number of these notes is 2:3:5. The total cash with Lakshmi is Rs 4,00,000. How many notes of each denomination does she have?

**54.** I have a total of Rs 300 in coins of denomination Re 1, Rs 2 and Rs 5. The number of Rs 2 coins is 3 times the number of Rs 5 coins. The total number of coins is 160. How many coins of each denomination are with me?

**55.** The organisers of an essay competition decide that a winner in the competition gets a prize of Rs 100 and a participant who does not win gets a prize of Rs 25. The total prize money distributed is Rs 3,000. Find the number of winners, if the total number of participants is 63.

**56.** The digits of a two-digit number differ by 3. If the digits are interchanged, and the resulting number is added to the original number, we get 143. What can be the original number?

**57.** Arjun is twice as old as Shriya. Five years ago his age was three times Shriya's age. Find their present ages.

**58.** A positive number is 5 times another number. If 21 is added to both the numbers, then one of the new numbers becomes twice the other new number. What are the numbers?

**59.** Sum of the digits of a two-digit number is 9. When we interchange the digits, it is found that the resulting new number is greater than the original number by 27. What is the two-digit number?

**60.** One of the two digits of a two digit number is three times the other digit. If you interchange the digits of this two-digit number and add the resulting number to the original number, you get 88. What is the original number?

**61.** Shobo's mother's present age is six times Shobo's present age. Shobo's age five years from now will be one third of his mother's present age. What are their present ages?

**62.** There is a narrow rectangular plot, reserved for a school, in Mahuli village. The length and breadth of the plot are in the ratio 11:4. At the rate Rs100 per metre it will cost the village panchayat Rs 75000 to fence the plot. What are the dimensions of the plot?

**63.** A grandfather is ten times older than his granddaughter. He is also 54 years older than her. Find their present ages.

**64.** A man's age is three times his son's age. Ten years ago he was five times his son's age. Find their present ages.

**65.** Present ages of Anu and Raj are in the ratio 4:5. Eight years from now the ratio of their ages will be 5:6. Find their present ages.