

Success Key Worksheet

Std: Class 10 (Eng.& Semi)

Ch.1 Linear Equ.in Two
Variable (DPP 1)

Time: 1 Hr.

Date:

Subject: Mathematics-1

Max Marks: 25

Q.1) Choose the correct alternative and write its alphabet with sub questions number.

20

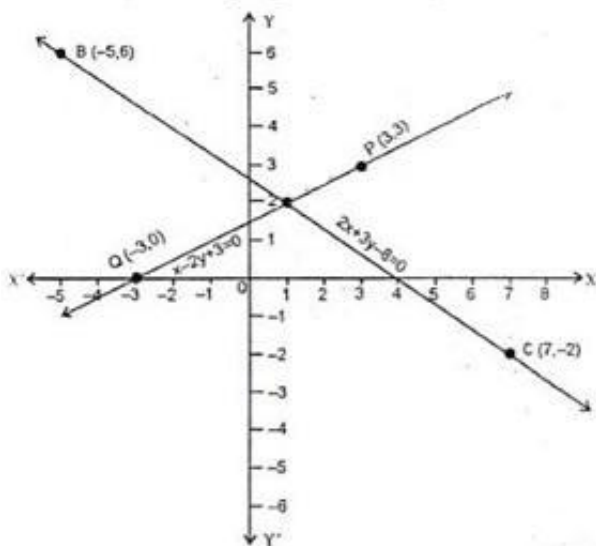
1) The value of k for which the pair of linear equations $4x + 6y - 1 = 0$ and $2x + ky - 7 = 0$ represents parallel lines is :

- (a) $k = 3$ (b) $k = 2$ (c) $k = 4$ (d) $k = -2$

2) Which of the following is not a solution of the pair of equations $3x - 2y = 4$ and $6x - 4y = 8$?

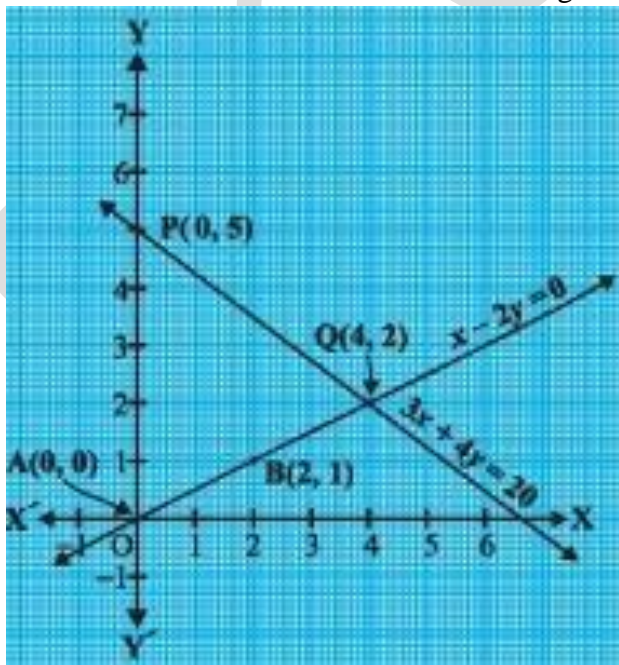
- (a) $x = 2, y = 1$ (b) $x = 4, y = 4$ (c) $x = 6, y = 7$ (d) $x = 5, y = 3$

3) Which of the following is point of intersection of given graph?



- (a) $x = 2, y = 0$ (b) $x = 0, y = 2$ (c) $x = 2, y = 1$ (d) $x = 1, y = 2$

4) The coordinates of the vertices of the triangle formed between the lines and y-axis from the graph is:



- (a) (4,2), (0,0) and (6.5,0) (b) (4,3) (0,6) and (0,0)
 (c) (0,5), (0,0) and (6, 0) (d) (0,5), (0,0) and (6.5, 0)

5) Which line represents the following table?

x	1	-2	4
y	0	2	-2

- (a) $2x + 3y = -2$ (b) $x + 2y = 8$ (c) $2x + 3y = 2$ (d) $x - 2y = 8$

6) The pair of equations $y = 0$ and $y = -5$ has:

- (a) no solution (b) one solution (c) two solution (d) infinitely many solutions

7) The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages, in years, of the son and the father are, respectively:

- (a) 4 and 24 (b) 5 and 30 (c) 6 and 36 (d) 3 and 24

8) To solve $3x - 4y = 1$, $2x + 3y = 12$ by determinant method find D_y .

- (a) 34 (b) -34 (c) 24 (d) -24

9) $x = 0$ and $y = 0$ are two lines

- (a) intersecting (b) parallel
 (c) overlapping (d) none of these

10)

Find the the value of $\begin{vmatrix} -10 & 2 \\ -11 & 5 \end{vmatrix}$

- (a) 25 (b) -27 (c) 24 (d) -28

11) To solve $3x + 4y = 19$, $2x - y = 9$ by determinant method find D.

- (a) 11 (b) -11 (c) 24 (d) -24

12)

Find the the value of $\begin{vmatrix} 4 & -10 \\ 3 & -11 \end{vmatrix}$

- (a) -12 (b) -13 (c) -10 (d) -14

13)

Find the the value of $\begin{vmatrix} 5 & 2 \\ 3 & 4 \end{vmatrix}$

- (a) 12 (b) 13 (c) 10 (d) 14

14) For simultaneous equations in variables x and y, $D_x = 49$, $D_y = -63$, $D = 7$ then what is x?

- (A) 7 (B) -7 (C) $\frac{1}{7}$ (D) $-\frac{1}{7}$

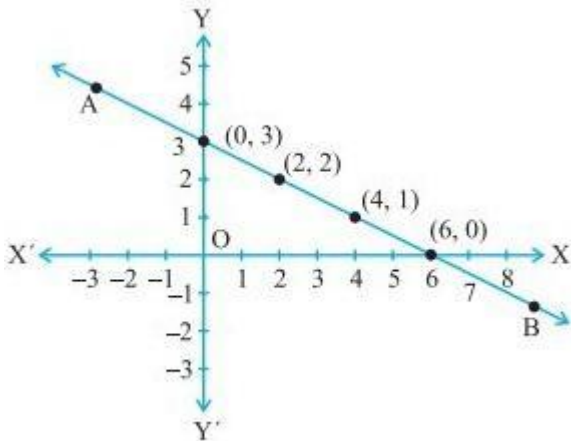
15)

Find the value of $\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix}$

- (a) -1 (b) -41 (c) 41 (d) 1

- 16) $ax + by = c$ and $mx + ny = d$ and $a \neq bm$ then these simultaneous equations have -
 (a) Only one common solution.
 (b) No solution.
 (c) Infinite number of solutions.
 (d) Only two solutions.
- 17) To solve $x + y = 3$; $3x - 2y - 4 = 0$ by determinant method find D.
 (a) 5 (b) 1 (c) -5 (d) -1
- 18) If Sonu can row 35 km downstream in 5 hours and 21 km upstream in 7 hours, then what is the speed of rowing in still water?
 (a) 2 km/hr (b) 3 km/hr (c) 4 km/hr (d) 5 km/hr
- 19)
 If $\frac{112}{x-y} + \frac{96}{x+y} = 7$ and $\frac{28}{x-y} + \frac{64}{x+y} = 3$ then find $x + y$
 (a) 32 (b) 30 (c) 28 (d) 26

- 20) The x intercept of the following line is



- (a) (0, 3) (b) (2, 2) (c) (4, 1) (d) (6, 0)

Q.2) Solve the following sub-question:

5

- 1) State with reason whether the equation $3x^2 - 7y = 13$ is a linear equation with two variables?
- 2) Show the condition using variables x and y : Two numbers differ by 3.
- 3) For the equation $4x + 5y = 20$, find y when $x = 0$.
- 4) Write any two solutions of the equation $x + y = 7$.
- 5) Decide whether $(0, 2)$ is the solution of the equation $5x + 3y = 6$.

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1)Ans. (a)

For parallel lines (no solution), $a_1/a_2 = b_1/b_2 \neq c_1/c_2$

$$4/2 = 6/k$$

$$k = 3$$

2)Ans. (d)

As the value of $x=5$ and $y=3$ does not satisfies any of the given equation, hence $(5,3)$ is not a solution of the pair of equations $3x-2y=4$ and $6x-4y=8$.

3)Ans. (d)

The two graph lines intersect at $(1, 2)$.

$$\therefore x = 1 \text{ and } y = 2.$$

4)Ans. (d)

The coordinates of the vertices of the triangle formed between the lines and y-axis from the graph is $(0,5)$, $(0,0)$ and $(6.5, 0)$.

5)Ans. (c)

$$\text{If } x = 1, y = 0$$

$$\text{then } 2x + 3y = 2(1) + 3(0) = 2 + 0 = 2$$

So, $2x + 3y = 2$ line represent given table.

6)Ans. (a)

As $y = 0$ and $y = -5$ will line on x-axis & they are parallel to each other so according to condition The equation has a parallel line that has no solution.

7)Ans. (c)

Let present ages of son and father be x and y respectively.

$$y = 6x \dots\dots (1)$$

$$y + 4 = 4(x + 4) \dots\dots (2)$$

Subtracting (1) from (2) we get, $4 = 4x + 16 - 6x$

$$x = 6 \text{ and } y = 6x = 36$$

8)Ans. (a)

$$D_y = \begin{vmatrix} 3 & 1 \\ 2 & 12 \end{vmatrix} = 3(12) - 1(2) = 36 - 2 = 34$$

9)Ans. (a) intersecting

$x = 0$ is the vertical line called y – axis and $y = 0$ is the horizontal line called as x – axis. Both the lines are intersecting each other at origin $(0, 0)$

10)Ans. (d)

$$\begin{vmatrix} -10 & 2 \\ -11 & 5 \end{vmatrix} = -10(5) - 2(-11) = -55 + 22 = -28$$

11)Ans. (b)

$$D = \begin{vmatrix} 3 & 4 \\ 2 & -1 \end{vmatrix} = 3(-1) - 4(2) = -3 - 8 = -11$$

12)Ans. (d)

$$\begin{vmatrix} 4 & -10 \\ 3 & -11 \end{vmatrix} = 4(-11) - 3(-10) = -44 + 30 = -14$$

13)Ans. (d)

$$\begin{vmatrix} 5 & 2 \\ 3 & 4 \end{vmatrix} = 5(4) - 2(3) = 20 - 6 = 14$$

14)Ans. (A) 7

$$D = 7; D_x = 49; D_y = -63$$

$$x = \frac{D_x}{D}$$

$$x = \frac{49}{7}$$

$$x = 7$$

$$x = 7$$

15)Ans.

(D) 1

The value of determinant $\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix}$ is

$$\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix} = 5(-4) - (-7)(3) \\ = -20 + 21 \\ = 1$$

(D) 1

The value of determinant $\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix}$ is

$$\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix} = 5(-4) - (-7)(3) \\ = -20 + 21 \\ = 1$$

16)Ans. (A) Only one common solution.
an \neq bm implies that an - bm \neq 0

That is, determinant is non zero

Thus, the system of simultaneous equations have only one common solution.

17)Ans. (C) -5

Given equations are $x + y = 3$; $3x - 2y - 4 = 0$

$$D = \begin{vmatrix} 1 & 1 \\ 3 & -2 \end{vmatrix} \\ = 1(-2) - 3(1) \\ = -2 - 3 \\ = -5$$

18)Ans. (d)

Let u and v be the speed of rowing (in stream) and the speed of stream respectively.

Therefore, according to the given information:

$$u + v = 35/5 = 7 \dots\dots (1)$$

$$u - v = 21/7 = 3 \dots\dots (2)$$

Adding equations (1) and (2): $2u = 10 \Rightarrow u = 5$

Thus, the speed of rowing in still water is 5 km/hr.

19)Ans. (c)

$$\frac{112}{x-y} + \frac{96}{x+y} = 7 \dots\dots (i)$$

$$\frac{28}{x-y} + \frac{64}{x+y} = 3 \dots\dots (ii)$$

$$\text{Let } \frac{1}{x-y} = u, \frac{1}{x+y} = v$$

$$112u + 96v = 7 \dots (3)$$

$$28u + 64v = 3 \dots (4)$$

Solve for u and v and substitute in (3) to get the required equations.

20)Ans. (d) (6, 0)

The x - intercept is the point where the line meets the x - axis.

Here x - intercept is (6, 0)

Q.2) Solve the following sub-question:

1)Ans. No

Reason: The degree of variable x is 2.

2)Ans. $x - y = 3$, where $x > y$

OR

$y - x = 3$, where $y > x$

3)Ans. Substituting $x = 0$ in $4x + 5y = 20$, we get

$$4(0) + 5y = 20$$

$$\therefore 5y = 20$$

$$\therefore y = \frac{20}{5} = 4$$

4)Ans. When $x = 1$, $y = 7 - 1 = 6$

When $x = 3$, $y = 7 - 3 = 4$

(1, 6) and (3, 4) are the solutions of $x + y = 7$

5)Ans. L.H.S. = $5x + 3y$

$$= 5(0) + 3(2)$$

$$= 0 + 6$$

$$= 6 = \text{R.H.S.}$$

(0, 2) is the solution of the given equation.

Success Key Worksheet

Std: Class 10 (Eng.& Semi)

Ch. 1 Linear Equation In Two Variable (DPP 2)

Time: 1 Hr.

Date:

Subject: Mathematics-1

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Q.1) Choose the correct alternative and write its alphabet with sub questions number.

20

- 1) Find the value of D_x for the equations $4x + 3y = 19$ and $4x - 3y = -11$.
(a) 24 (b) 0
(c) -24 (d) 108
- 2) The solution of the equations $x - y = 10$ and $x + y = 70$ is _____.
(a) (40, 30) (b) (30, 40)
(c) (10, 60) (d) (50, 20)
- 3) The solution of the equation $2x - y = 2$ is _____.
(a) (2, 2) (b) (5, 2)
(c) (2, 5) (d) (5, 5)
- 4) If $49x - 57y = 172$ and $57x - 49y = 252$, then $x + y = ?$
(a) 80 (b) 0
(c) 10 (d) 8
- 5) For equation $5x + 3y + 11 = 0$ and $2x + 4y = -10$, find D .
(a) 14 (b) -14
(c) 26 (d) -26
- 6) $\begin{vmatrix} 3 & 5 \\ 2 & x \end{vmatrix} = 2 \therefore x = \underline{\hspace{2cm}}$
(a) 3 (b) 4
(c) -3 (d) -4
- 7) Which of the following is linear equation in two variables?
(a) (b) $2x^2 - 3y = 8 - 3y$
(c) $x + 2y = 5 - 3y$ (d) $3x^2 + y = 0$
- 8) For the equations with variables x and y , if $D_x = 26$, $D_y = -39$, and $D = 13$, then $x = ?$
(a) 2 (b) -3
(c) -2 (d) 3
- 9) For simultaneous equations in variables x and y , $D_x = 49$, $D_y = -63$, $D = 7$, then what is the value of y ?
(a) 9 (b) 7 (c) -7 (d) -9
- 10) To draw graph of $4x + 5y = 19$, Find y when $x = 1$.
(a) 4 (b) 3 (c) 2 (d) -3
- 11) Graph of every linear equation in two variables represents a
(a) Straight line (b) Point (c) Line (d) Ray

- 12) Which statement is correct regarding $ax + by + c = 0$?
- (a) It is general linear equation of two variable
 (b) a, b, c are real number
 (c) a, b are not equal to zero
 (d) All of these
- 13) The general linear equation of two variable is_____.
- (a) $ax + by + c = 0$ (b) $ax + c = 0$ (c) $ax^2 + by + c = 0$ (d) $ax^2 + by = 0$
- 14) To solve $2x + 3y = 13$, $5x - y = 7$ by determinant method find D_x .
- (a) 31 (b) -31 (c) 34 (d) -34
- 15) What is the equation $y = 0.25x - 0.75$ in general form?
- (a) $-x + 4y - 3 = 0$ (b) $x - 4y - 3 = 0$ (c) $-x + 4y + 3 = 0$ (d) $-4y + 3 = 0$
- 16) To solve $3x + 2y = -2$, $2x + 5y = -5$ by determinant method find D.
- (a) 11 (b) -11 (c) 24 (d) -24
- 17) If $x = a$, $y = b$ is the solution of the equation $x - y = 2$ and $x + y = 4$, then the value of a and b are respectively
- (a) (3,5) (b) (5,2) (c) (3,1) (d) (-1,-3)
- 18)
- The value of determinant $\begin{vmatrix} 5 & -3 \\ -2 & 1 \end{vmatrix}$ is
- (a) 0 (b) 1 (c) -1 (d) 11
- 19)
- What is the degree of the determinant $\begin{vmatrix} a & b \\ c & d \end{vmatrix}$?
- (a) 1 (b) 3 (c) 4 (d) 2
- 20) If a sailor goes 8 km downstream in 420 minutes and returns in 1 hour. Then the speed of the sailor in still water is_____.
- (a) 2 km/h (b) 12 km/h (c) 8 km/h (d) 10 km/h

Q.2) Solve the following sub-question:

- 1) If $Dx = 24$ and $x = -3$, then find the value of D.
- 2) If $x + 2y = 5$ and $2x + y = 7$, then find the value of $x + y$.
- 3) The cost of the book is 5 rupees more than twice the cost of a pen. Show this using linear equation by taking Cost of book (x) and cost of a pen (y).
- 4) If $\frac{a}{4} + \frac{b}{3} = 4$, write the equation in standard form.
- 5) Write any two solutions of the equation $a - b = -3$.

Success Key Worksheet

Std: Class 10 (Eng.& Semi)

Ch.1 Linear Equation in Two
Variable DPP 2 (Answer key)

Time: 1 Hr.

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Q.1) Choose the correct alternative and write its alphabet with sub questions number.

20

1)Ans. C

Here, $a_1 = 4, b_1 = 3, c_1 = 19$

$a_2 = 4, b_2 = -3, c_2 = -11$

$$D = \begin{vmatrix} c_1 & b_1 \\ c_2 & b_2 \end{vmatrix} = \begin{vmatrix} 19 & 3 \\ -11 & -3 \end{vmatrix} = -57 + 33 = -24$$

2)Ans. A

$$x - y = 10$$

$$+x + y = 70$$

$$\hline 2x = 80$$

$$x = \frac{80}{2} = 40$$

Substituting $x = 40$ in $x + y = 70$, we get

$$40 + y = 70$$

$$y = 70 - 40 = 30$$

3)Ans. A

Consider option (A)

$$2x - y = 2(2) - 2$$

$$= 4 - 2 = 2$$

4)Ans. C

$$49x - 57y = 172$$

$$57x - 49y = 252$$

$$\begin{array}{r} - \quad + \quad - \\ \hline -8x - 8y = -80 \end{array}$$

$$\therefore x + y = \frac{-80}{-8} = 10$$

5)Ans. A

Here, $a_1 = 5, b_1 = 3$

$a_2 = 2, b_2 = 4$

$$\therefore D = \begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix} = \begin{vmatrix} 5 & 3 \\ 2 & 4 \end{vmatrix} = 20 - 6 = 14$$

6)Ans. B

$$\begin{vmatrix} 3 & 5 \\ 2 & x \end{vmatrix} = 2$$

$$\therefore 3x - 10 = 12$$

$$\therefore 3x = 12$$

$$\therefore x = 4$$

7)Ans. C

An equation of the form $ax + by + c = 0$ is called a linear equation in two variables x and y ,

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

$$\therefore x + 5y - 5 = 0$$

8)Ans. A

$$x = \frac{D_x}{D} = \frac{26}{13} = 2$$

$$\frac{x}{3} + \frac{5}{y} = 6$$

9)Ans. (b) 7

10)Ans. (B) 3

Place $x = 1$ in $4x + 5y = 19$

$$4(1) + 5y = 19$$

$$4 + 5y = 19$$

$$5y = 19 - 4$$

$$5y = 15$$

$$y = \frac{15}{5}$$

$$y = 3$$

11)Ans. (a) Straight line

Graph of every linear equation in two variables represents a straight line

12)Ans. (d)

Explanation $ax + by + c = 0$ is the general linear equation of two variable; a, b, c are real number and a, b , are not equal to zero.

13)Ans. (a)

Explanation: $ax + by + c = 0$ is the general linear equation of two variable; a, b, c are real number and a, b , are not equal to zero.

14)Ans. (d)

$$D_x = \begin{vmatrix} 13 & 3 \\ 7 & -1 \end{vmatrix} = 13(-1) - 7(3) = -13 - 21 = -34$$

15)Ans. (b)

Explanation

$$y = 0.25x - 0.75$$

Multiplying on both side by 4

$$4y = x - 3$$

$$x - 4y - 3 = 0$$

16)Ans. (b)

$$D = \begin{vmatrix} 3 & 2 \\ 2 & 5 \end{vmatrix} = 3(5) - 2(2) = 15 - 4 = 11$$

17)Ans. (c)

$$x - y = 2 \text{----- (i)}$$

$$x + y = 4 \text{..... (ii)}$$

Add (i) and (ii)

$$2x = 6$$

$$\Rightarrow x = 6/2 = 3$$

Put $x = 3$ in (ii), we get

$$3 + y = 4$$

$$\Rightarrow y = 4 - 3 =$$

18)Ans. (c) -1

$$\begin{vmatrix} 5 & -3 \\ -2 & 1 \end{vmatrix} = 5(1) - (-2)(-3) \\ = 5 - 6 \\ = -1$$

19)Ans. (d) 2

20)Ans. d)

Let the speed of the sailor in still water be x km/h and that of the current y km/h.

Speed downstream = $(x + y)$ km/h

Speed upstream = $(x - y)$ km/h

As per the question $(x + y) \times 40/60 = 8$

$$\Rightarrow x + y = 12 \quad \dots\dots\dots(i)$$

When the sailor goes upstream, then

$$(x - y) \times 1 = 8 \quad x - y = 8 \quad \dots\dots\dots(ii)$$

Adding (i) and (ii), we get

$$2x = 20$$

$$\Rightarrow x = 10$$

Hence, the speeds of the sailor in still water is 10 km/h .

Q.2) Solve the following sub-question:

1)Ans.

$$x = \frac{D_x}{D} \\ \therefore D = \frac{D_x}{x} = \frac{24}{-3} = -8$$

2)Ans.

$$\begin{aligned} x + 2y &= 5 \\ +2x + y &= 7 \\ \hline 3x + 3y &= 12 \\ \therefore x + y &= \frac{12}{3} = 4 \end{aligned}$$

3)Ans. $x = 2y + 5$

$$\therefore x - 2y = 5$$

4)Ans.

$$\begin{aligned} \frac{a}{4} + \frac{b}{3} &= 4 \\ \therefore \frac{3a + 4b}{12} &= 4 \\ \therefore 3a + 4b &= 48 \\ \therefore 3a + 4b - 48 &= 0 \end{aligned}$$

5)Ans. When $b = 1$, $a = -3 + 1 = -2$

When $b = 4$, $a = -3 + 4 = 1$

$(-2, 1)$ and $(1, 4)$ are the solutions of $a - b = -3$.