



**QA_Solving Linear Equations
Worksheet**

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

a) $x - 3y = 7$

b) $2x + 3y = 5$

c) $3x = y$

d) $11x - 12y = 12$

2) Check which of the following are the solutions of the equation $4x - 5y + 6 = 0$

a) (3, 2)

b) (6, 6)

c) (1, 2)

d) (-2, -4)

3) Find three solutions of each of the following linear equations in one variable, when expressed as a linear equation in two variables.

a) $2x - 11 = 0$

b) $x = 3$

c) $5y - 10 = 0$

d) $y = \frac{1}{3}$

4) In each of the following, find the value of 'k' if:

a) (-4, 6) is a solution of the equation $8x + 3y = k$.

b) $x = -2, y = 3$ is a solution of the equation $4x - ky + 14 = 0$.

c) $x = 2, y = 7$ is a solution of the equation $y = kx + 13$.



- 5) If $(a, 0)$ and $(0, b)$ are the solutions of the linear equation $2x - 5y + 10 = 0$
Find the value of 'a' and 'b'.
- 6) If $x = k - 3$ and $y = k + 3$, is a solution of the equation $2x - 7y + 12 = 0$, find the value of 'k'. Also find 'x' and 'y'.
- 7) A man is 30 years old when his daughter is born.
- Form an equation to represent this situation.
 - Using the equation, find the age of the man, when his daughter is 15 years old.
 - Also use the equation to find the age of the daughter, when her father is 65 years old.
- 8) There is a discount of 20% on the marked price of a watch.
- Form an equation to represent this situation.
 - If the discount is ₹250, find the marked price of the watch.
 - If the marked price of the watch is ₹ 2250, find the discount.
- 9) Form an equation one of whose solution is $(10, 3)$. Find three more solutions of the equation.
- 10) Give a situation involving two variables and express it as a linear equation in two variables. Also find three of its solutions.
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QA_Solving Linear Equations Worksheet Key

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

Solution:

a) $x - 3y = 7$

	Let	Find the other variable	Solution
(i)	$x = 0$	$0 - 3y = 7$ $\Rightarrow y = -\frac{7}{3}$	$(0, -\frac{7}{3})$
(ii)	$y = 0$	$x - 3(0) = 7$ $\Rightarrow x - 0 = 7$ $\Rightarrow x = 7$	$(7, 0)$
(iii)	$x = 1$	$\Rightarrow 1 - 3y = 7$ $\Rightarrow y = -2$	$(1, -2)$

b) $2x + 3y = 5$

	Let	Find the other variable	Solution
(i)	$x = 0$	$2(0) + 3y = 5$ $\Rightarrow 3y = 5$ $\Rightarrow y = \frac{5}{3}$	$(0, \frac{5}{3})$
(ii)	$y = 0$	$2x + 3(0) = 5$ $\Rightarrow 2x + 0 = 5$ $\Rightarrow x = \frac{5}{2}$	$(\frac{5}{2}, 0)$
(iii)	$x = 2$	$\Rightarrow 2(2) + 3y = 5$ $\Rightarrow 4 + 3y = 5$ $\Rightarrow 3y = 5 - 4$ $\Rightarrow 3y = 1$ $\Rightarrow y = \frac{1}{3}$	$(2, \frac{1}{3})$



c) $3x = y$

	Let	Find the other variable	Solution
(i)	$x = 0$	$3(0) = y$ $\Rightarrow y = 0$	$(0, 0)$
(ii)	$y = -1$	$3x = -1$ $\Rightarrow x = -\frac{1}{3}$	$(-\frac{1}{3}, -1)$
(iii)	$x = 2$	$\Rightarrow 3(2) = y$ $\Rightarrow y = 6$	$(2, 6)$

d) $11x - 12y = 12$

	Let	Find the other variable	Solution
(i)	$x = 0$	$11(0) - 12y = 12$ $\Rightarrow -12y = 12$ $\Rightarrow y = \frac{12}{-12}$ $\Rightarrow y = -1$	$(0, -1)$
(ii)	$y = 0$	$11x - 12(0) = 12$ $\Rightarrow 11x = 12$ $\Rightarrow x = \frac{12}{11}$	$(\frac{12}{11}, 0)$
(iii)	$x = -2$	$11(-2) - 12y = 12$ $\Rightarrow -22 - 12y = 12$ $\Rightarrow -12y = 12 + 22$ $\Rightarrow -12y = 34$ $\Rightarrow y = -\frac{34}{12}$	$(-2, -\frac{34}{12})$



2) Check which of the following are the solutions of the equation $4x - 5y + 6 = 0$

Solution:

S. No	Ordered Pair	LHS	RHS	Comparing the LHS and RHS of the equation	Conclusion
a)	(3, 2)	$4(3) - 5(2) + 6$ $= 12 - 10 + 6$ $= 8$	0	LHS $\neq$ RHS	(3, 2) is not a solution
b)	(6, 6)	$4(6) - 5(6) + 6$ $= 24 - 30 + 6$ $= 0$	0	LHS = RHS	(6, 6) is a solution
c)	(1, 2)	$4(1) - 5(2) + 6$ $= 4 - 10 + 6$ $= 0$	0	LHS = RHS	(1, 2) is a solution
d)	(-2, -4)	$4(-2) - 5(-4) + 6$ $= -8 + 20 + 6$ $= 18$	0	LHS $\neq$ RHS	(-2, -4) not a solution

3) Find three solutions of each of the following linear equations in one variable, when expressed as a linear equation in two variables.

Solution:

a) $2x - 11 = 0$
 $\Rightarrow 2x = 11$
 $\Rightarrow x = \frac{11}{2}$

The three solutions: $(\frac{11}{2}, 0)$, $(\frac{11}{2}, 1)$, $(\frac{11}{2}, 2)$

b) $x = 3$

The three solutions: $(3, 0)$, $(3, -1)$, $(3, 2)$



c) $5y - 10 = 0$
 $\Rightarrow 5y = 10$
 $\Rightarrow y = \frac{10}{5}$
 $\Rightarrow y = 2$

The three solutions: $(0, 2), (2, 2), (3, 2)$

d) $y = \frac{1}{3}$

The three solutions: $(0, \frac{1}{3}), (5, \frac{1}{3}), (3, \frac{1}{3})$

4) In each of the following, find the value of 'k', if:

a) $(-4, 6)$ is a solution of the equation $8x + 3y = k$.

Solution:

Since $(-4, 6)$ is a solution of the equation $8x + 3y = k$, substituting $x = -4$ and $y = 6$ in the equation, makes the two sides equal.

$$\begin{aligned}\Rightarrow 8(-4) + 3(6) &= k \\ \Rightarrow -32 + 18 &= k \\ \Rightarrow -14 &= k\end{aligned}$$

So, $k = -14$

b) $x = -2, y = 3$ is a solution of the equation $4x - ky + 14 = 0$.

Solution:

Since $(-2, 3)$ is a solution of the equation $4x - ky + 14 = 0$, substituting $x = -2$ and $y = 3$ in the equation, makes the two sides equal.

$$\begin{aligned}\Rightarrow 4(-2) - k(3) + 14 &= 0 \\ \Rightarrow -8 - 3k + 14 &= 0 \\ \Rightarrow 6 - 3k &= 0 \\ \Rightarrow -3k &= -6 \\ \Rightarrow k &= \frac{6}{3} \\ \Rightarrow k &= 2\end{aligned}$$

So, $k = 2$



- c) $x = 2, y = 7$ is a solution of the equation $y = kx + 13$.

Solution:

Since $(2, 7)$ is a solution of the equation $y = kx + 13$, substituting $x = 2$ and $y = 7$ in the equation, makes the two sides equal.

$$\Rightarrow 7 = k(2) + 13$$

$$\Rightarrow 7 - 13 = 2k$$

$$\Rightarrow -6 = 2k$$

$$\Rightarrow k = \frac{-6}{2}$$

$$\Rightarrow k = -3$$

So, $k = -3$

- 5) If $(a, 0)$ and $(0, b)$ are the solutions of the linear equation $2x - 5y + 10 = 0$, find the value of 'a' and 'b'.

Solution:

Since $(a, 0)$ is a solution of the equation, substituting $x = a$ and $y = 0$ in the equation, makes its two sides equal.

$$\Rightarrow 2(a) - 5(0) + 10 = 0$$

$$\Rightarrow 2a + 10 = 0$$

$$\Rightarrow 2a = -10$$

$$\Rightarrow a = \frac{-10}{2}$$

$$\Rightarrow a = -5$$

Since $(0, b)$ is a solution of the equation, substituting $x = 0$ and $y = b$ in the equation, makes its two sides equal.

$$\Rightarrow 2(0) - 5(b) + 10 = 0$$

$$\Rightarrow -5b + 10 = 0$$

$$\Rightarrow -5b = -10$$

$$\Rightarrow b = \frac{-10}{-5}$$

$$\Rightarrow b = 2$$

So, $a = -5$ and $b = 2$

$\Rightarrow (-5, 0)$ and $(0, 2)$ are the given solutions of the linear equation $2x - 5y + 10 = 0$,



- 6) If $x = k - 3$ and $y = k + 3$, is a solution of the equation $2x - 7y + 12 = 0$, find the value of 'k'. Also find x and y .

Solution:

Since $(k - 3, k + 3)$ is a solution of the equation, substituting $x = k - 3$ and $y = k + 3$ in the equation, makes its two sides equal.

$$\Rightarrow 2(k - 3) - 7(k + 3) + 12 = 0$$

$$\Rightarrow 2k - 6 - 7k - 21 + 12 = 0$$

$$\Rightarrow -5k - 15 = 0$$

$$\Rightarrow k = \frac{15}{-5}$$

$$\Rightarrow k = -3$$

$$\text{So, } x = k - 3 = -3 - 3 = -6 \text{ and } y = -3 + 3 = 0$$

- 7) A man was 30 years old when his daughter was born.

- a) Form an equation to represent this situation.

Solution:

Let the age of the father be ' x ' and ' y ' be the age of the daughter.

The equation is $x = y + 30$

- b) Using the equation, find the age of the man, when his daughter is 15 years old.

Solution:

The age of the daughter is 15 years, so $y = 15$

$$\Rightarrow x = y + 30$$

$$\Rightarrow x = 15 + 30$$

$$\Rightarrow x = 45$$

The age of father is 45 years, when his daughter is 15 years.

- c) Also use the equation to find the age of the daughter, when her father is 65 years old.

Solution:

Age of father is 65 years. So, $x = 65$.

$$x = y + 30$$

$$\Rightarrow 65 = y + 30$$

$$\Rightarrow y = 65 - 30$$

$$\Rightarrow y = 35$$

So the daughter is 35 years old, when her father is 65 years of age.



8) There is a discount of 20% on the marked price of a watch.

a) Form an equation to represent this situation.

Solution:

Let the discount be ' p ' and the marked price of the watch be ' q '.

The equation is:

$$\begin{aligned} p &= 20\% q \\ \Rightarrow p &= \frac{20}{100} q \\ \Rightarrow p &= \frac{1}{5} q \end{aligned}$$

b) If the discount is ₹250, find the price of the watch.

Solution:

The discount is ₹ 250, so $p = 250$

Substituting the value of ' p ' in the equation $p = \frac{1}{5} q$:

$$\begin{aligned} \Rightarrow 250 &= \frac{1}{5} q \\ \Rightarrow 250(5) &= q \\ \Rightarrow 1250 &= q \end{aligned}$$

If the discount is ₹250, the marked price of the watch is ₹1250.

c) If the marked price of the watch is ₹2250, find the discount.

Solution:

The marked price of the watch is ₹2250, so $q = 2250$

Substituting the value of ' q ' in the equation $p = \frac{1}{5} q$:

$$\begin{aligned} \Rightarrow p &= \frac{1}{5} (2250) \\ \Rightarrow p &= 450 \end{aligned}$$

$\Rightarrow$ the discount on the watch is ₹450, when its marked price is ₹2250.

9) Form an equation one of whose solution is (10, 3). Find three more solutions of the equation.

Solution:

By observing the value of x and y in the ordered pair (10, 3), one of the equations can be $x + y = 13$

Three more solutions of this equation are (6, 7), (-5, 18) and (3, 10).



- 10) Give a situation involving two variables and express it as a linear equation in two variables. Also find three of its solutions.

Solution:

The student gives any situation involving two variables, expresses it as a linear equation in two variables and finds three of its solutions.

Sri Sathya Sai Central Trust