

SOLVING LINEAR EQUATIONS

Linear equations are equations that have two variables.

- When graphed, a linear equation is a straight line. Although the standard equation for a line is $y = mx + b$, where m is the slope and b is the y-intercept, linear equations often have both of the variables on the same side of the equal sign.
- Linear equations can be written verbally and translated into algebraic form.
- Linear equations can be **solved** for one variable when the other variable is given.



PREVIEW

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- For example, what is 'twice a number is increased by another number is sixty-one' in algebraic form?

Ex. twice a number $\rightarrow 2x$
 increased by another number $\rightarrow + y$
 is sixty-one $\rightarrow = 61$

The result is $2x + y = 61$

Once a linear equation is translated into the algebraic form, it can be **solved** for one of the variables if given the other variable.

- For example, what is y in the equation, $2x + y = 61$, when x is 19? To solve, 19 is substituted for x and the equation is solved for y .

$$\text{Ex. } 2(19) + y = 61 \rightarrow 38 + y = 61 \rightarrow y = 23$$

The result is that x is 19 and y is 23 or $(19, 23)$. In this case, the one variable was given and the equation was solved to find the other variable.

In some cases, an **ordered pair** will be given to see if it is a solution set for an equation.

- For example, if the ordered pair $(-2, 3)$ is a solution set for the equation $2x + y = 1$, then $x = -2$ and $y = 3$ are substituted into the equation to see if the equation is true.

Since
equation
 $x = -2$
was

Try



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line
point

1. What is 'four times a number diminished by seven is two times another number' in algebraic form?
2. What is the **value of y** in the linear equation, $5x + 8 = y - 2$ when x is -3 ?
3. What is the **value of y** in the linear equation, $3y = -2x - 10$ when y is -4 ?
4. Is the ordered pair, $(6, -3)$, a **solution set** for the linear equation, $1/3x + 2y = 4$?
5. Is the ordered pair, $(10, -10)$, a **solution set** for the linear equation, $2x - 40 = 2y$?