

Linear Equations with One Variable

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Expressions, Equations, and Inequalities

7th grade

Missouri Learning
Standards (MLS)

7.EEI.B.4.a

Objective

Solve problems using numerical and algebraic expressions and equations.

Write and/or solve linear equations and inequalities in one variable.

- a. Write and/or solve equations of the form $x+p=q$ and $px=q$ in which p and q are rational numbers.**

Prior Knowledge Needed

- Students will need to know how to read and write.
- Students will need to know how to add and subtract.
- Students will need to know how to multiply and divide.

Solve equation $px=q$

Equations such as $px = q$ are called **linear equations** because when graphed, they will give you a straight line. The x variable does not have an exponent with it, because linear equations never have exponents for their variables.

Remember, you want to isolate your x variable and move everything over to the other side. Here are your steps.

1. Divide by p on both sides. This gives you $px / p = q / p$, which simplifies to $x = q / p$.

Solve equation $x + p = q$

Equations such as $x + p = q$ are called **linear equations** because when graphed, they will give you a straight line. The x variable does not have an exponent with it, because linear equations never have exponents for their variables.

Remember, you want to isolate your x variable and move everything over to the other side. Here are your steps.

1. Subtract by p on both sides. This gives you $x + p - p = q - p$, which simplifies to $x = q - p$.

Let's look at an example!

$$X + 9 = 17 \text{ (remember, we want } X \text{ by itself)}$$

$$\begin{array}{r} X + 9 = 17 \\ - 9 = -9 \\ \hline \end{array}$$

$$X = 8$$

Let's look at another example!

$$7x = 56$$

$$\frac{\text{-----}}{7} = \frac{\text{-----}}{7}$$

$7/7 = 1x$, which is just x .

$56/7 = 8$ So your answer is: $x = 8$.

Let's look at a word problem:

Natalie bought moccasins for \$77 in the village. How much did she pay the villager, if she received \$23 in change?

Rocky wanted to make enough money to buy a new horse. If the horse cost \$125, how many deer hides will Rocky have to sell to afford the horse? Deer hides cost \$25.

John was gifted several arrows. He gave 13 to his friend Rhea and was left with 11 arrows for himself. How many arrows was John gifted?