## Lesson D3: Solving Single Variable Equations

Sam buys 3 sodas for $\$ 6$ total. We will be using the models below to answer the question, "What is the cost for 1 soda?"


Here are two models that represent this situation.


1. Write an equation that is represented by these models.

What does the variable mean in each context?
2. To solve this equation using algebra, we use what is known as inverse operations. See the chart below and complete the right column.

| Operation | Inverse |
| :---: | :---: |
| Addition | Subtraction |
| Multiplication |  |
| Subtraction |  |
| Division |  |

3. Take the equation you wrote for Question 1 and show or explain how it is the same as $3 x=6$.

The picture below shows one way to solve the equation, using inverse operations.


4. Jess and Julissa's parents gave them \$14.

We will use the balance model to answer the question, " If Jess has \$6, how much does Julissa have?"

Here is the balance model that shows this situation.

a. Show an equation to match this model.
b. Explain how your equation is the same as $6+x=14$.

The picture below shows one way to solve the equation, using inverse operations.


## Practice

5. Leo and Ivy are ordering cheeseburgers.

Leo orders 4 burgers and Ivy orders 2 burgers with a total cost of $\$ 9$.
a) Write the equation your model represents.
b) How much does a single burger cost?
6. Oliver is in a hurry. He needs baby diapers, so he runs into Kroger to get some. At the register, he hands the clerk a $\$ 20$ bill and gets change. In his car, he realized he didn't remember the cost of the diapers and accidentally threw away the receipt! He checks his wallet and realizes he received $\$ 4$ in change.
a) Use a balance model to describe this problem.
b) What was the cost of the diapers?
7. Kayla and friends are at Kings Island. They are keeping track of their steps for a school fitness challenge. The challenge wants groups of four to achieve 40,000 steps total. If each person takes the same number of steps, how many steps does Kayla need to take in order to meet the challenge?
8. You're buying snacks at Piggly Wiggly.

You spend a total of \$16 on 5 CocaColas, 4 Snickers and a bag of Takis. The CocaColas cost $\$ 1.60$ each, the Snickers are $\$ 1$ each.
How much is a bag of Takis?
9. Evaluate each equation. Use any method you like.
a. Let $x=4$. Check if the following equation is true or false. $3 x=12$
b. Let $p=6$. Check if the following equation is true or false: $9+p=3$
c. Find the value of $y$ for this equation: $4+6-2=y+6$

## Summary

In this lesson we used different models for solving equations. We then went over how to solve equations algebraically using inverse operations. Finally, we practiced solving equations in and out of context.

All models/strategies can lead you to a solution. Some models/strategies are better suited for certain types of problems. The more models you can choose from, the easier the solving process can be. Showing your work, no matter what the strategy you use, can help catch and avoid mistakes!

