**Solving Equations that Contain Like Terms**

1. Two computer technicians are upgrading software on 51 computers in a school. On average, Marissa upgrades 5 computers in 1 hour and Ryan upgrades 7 computers in 1 hour. We want to know how long it will take for both of them to upgrade the 51 computers. We can use several strategies to solve this problem.
2. What is unknown in this problem?
3. Complete the table that shows the number of computers upgraded by each technician and the total number of computers upgraded after 0, 1, 2, 3, 4, and 5 hours.

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of Hours** | **Number of Computers Marissa Upgraded** | **Number of Computers Ryan Upgraded** | **Total Computers Upgraded** |
| 0 |  |  |  |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| *t* |  |  |  |

1. Make a graph that represents the total number of computers upgraded after each hour.



1. Use the graph to estimate the number of hours it took to upgrade all the computers.
2. Let *t* equal the number of hours that Marissa and Ryan upgrade computers. Write an expression for the total number of computers upgraded in *t* hours.
3. Write an equation to determine the amount of time it will take Marissa and Ryan to upgrade 51 computers. Then solve the equation.
4. Write your answer in a sentence.
5. In your own words, why do you think we were able to combine the technicians’ work?
6. A skateboard park charges $7 per session to skate and $4 per session to rent safety equipment. Jared skates safely and rents safety equipment every time he skates. He bought a new skateboard for $125 in the spring. During the year, he spent $224 for his skateboard, skating charges, and equipment rentals. How many skating sessions did he attend?
7. Define your variable(s).
8. Write an equation that can be used to find the number of sessions Jared attended.
9. Solve the equation. List your steps and show your work.
10. Write your answer in a sentence.
11. When Jared’s friend Rocco tried to solve this problem he took the following steps.

$$7s+4s+125=225$$

$$136s=224$$

$$s=1.65$$

 Rocco concluded that since Jared can’t skate 0.65 times, he skated once.

 Explain to Rocco what he did wrong and why it is mathematically illegal. Also explain what he should he have done to solve the problem. Write your explanation below.

 *Dear Rocco,*

1. The crazy game show called “Mud-Tower” begins with a pile of mud that weighs 20 pounds. The Blue-Team has to add mud to that pile, while the Red-Team has to remove mud from the same pile at the same time. The Red-Team is scooping-away an average of 0.75 lbs of mud every second. The Blue-Team is piling-on an average 0.55 lbs of mud every second.

a) Write an expression that represents the final weight of the mud pile based on how many seconds the two teams have been competing.

1. When the game ended there was a total of 10 pounds of mud left in the pile. Write and solve an equation to determine the number of seconds it took for the game to finish. List your steps, show your work, and write your answer in a complete sentence.
2. Rocco tried to solve this problem he took the following steps.

$$20-0.75s+0.55s=10$$

$$20-1.3s=10$$

$$-1.3s=-10$$

$$s=7.69$$

 Rocco concluded that the game lasted 7.69 seconds.

 Explain to Rocco what he did wrong and why it is mathematically illegal. Explain what he should have done to solve the problem.

 *Dear Rocco*,

1. Julie purchased tickets to a Mets baseball game from the Mets website. Each ticket costs $19 and the website charged a convenience fee of $5.75 per ticket. To celebrate going to the game, Julie also bought a new jersey from the website for $60.
2. Write an expression that represents the total amount of money she spent on the website based on the number of tickets she bought. First define your variable.
3. If her bill came to $159.00, how many tickets did she buy? Write and solve an equation, list your steps, show you work, and then write your answer in a complete sentence.