**Introduction to the Elimination Method**

1. Solve the following problem: The sum of two numbers is 20, and their difference is 2. Find the two numbers.
2. The system of equations below models this problem if \_\_\_\_ represents the larger number and \_\_\_ represents the smaller number.

*x* + *y* = 20

*x – y =* 2

1. In the space above, add the two equations together (left side added to left side, right side added to right side). You now have an equation in one variable. Which variable is it, *x* or *y*?
2. Solve for the variable in part (b). Then substitute it into one of the original equations to solve for the other variable.
3. Graph both equations by using the *x*-intercept and *y*-intercept on the coordinate plane above. Identify the intersection point.
4. Solve each of these systems by adding the two equations together to eliminate one of the variables.

a. –*x* + 2*y* = 5 b. *x* – 2*y* = 7

*x* + *y* = 7 3*x* + 2*y* = 13

1. Consider the following system of equations:

5*x* – 2*y* = 19

3*x* + *y* = 7

1. What happens when you add these equations together? Is one of the variables eliminated? Show your work below.
2. Go back to the initial system. Multiply both sides of the second equation by 2. Now add this new equation to the first equation. What happens?
3. Complete the solution to this system of equations.

4. Write a system of equations for this problem and solve it by elimination:

The sum of two numbers is 12. When 3 times the smaller number is subtracted from the larger number, the result is 4. Find the two numbers.

1. Find the sum of these two fractions: .
2. Solve this system by first eliminating the variable *y*. (Hint: You will have to find one number to multiply the first equation by and a second number to multiply the second equation by.)

2*x* + 3*y* = 9

5*x* – 4*y* = 11

1. How are questions 5 and 6 related?
2. Explain how you used the addition and multiplication properties of equality to solve systems of equations using the elimination method.