**Barron’s Let’s Review Regents – Algebra I**

# Chapter 4: Systems of Linear Equations

## 4.1 Solving Systems with Guess and Check

### Finding an Ordered Pair That Satisfies an Equation with Two Variables

### Checking to See If an Ordered Pair Is Part of the Solution Set of a Two-Variable Equation

### Identifying Equations That Have Equivalent Solution Sets

### Solving Systems of Equations by Guess and Check

The guess and check method is not very practical unless it is a multiple-choice question where there are at most four ordered pairs to check.

### Check Your Understanding of Section 4.1

1. Multiple-Choice
2. (2, 5) is a solution to which equation?  
   2(2) + 5 = 9 ck.  
   **(2) 2x + y = 9**
3. Which ordered pair is a solution to the equation 3y – 4x = 3?  
   (1) (3, 5) => x = 3, y = 5  
   3(5) – 4(3) ≟ 3  
   15 – 12 = 3 ck  
   **(1) (3, 5)**
4. Which ordered pair is ***not*** a solution to the equation 3y – 2x = 3?  
   **(4) (10, 8) => x = 10, y = 8**3(8) – 2(10) ≟ 3  
   24 – 20 3 (not a solution)
5. Which equation has the same solution as the equation 2x + 3y = 5?  
   Multiply by 4: 8x + 12y = 20  
   **(1) 8x + 12y = 20**
6. Which equation does not have the same solution as the equation 4x – 8y = 12?  
   **(1) 6x – 7y = 20**
7. Which is the solution set to this system of equations?  
   2x + 3y = 20  
   5x – 2y = 31  
     
   (1) (4,4)  
   2(4) + 3(4) ≟ 20  
   8 + 12 = 20 ck  
   5(4) – 2(4) ≟ 31  
   20 – 8 failed  
     
   (2) (1, 6)  
   2(1) + 3(6) ≟ 20  
   2 + 18 = 20 ck  
   5(1) – 2(6) ≟ 31  
   5 – 12 31 – failed  
     
   (3) (-2, 8)  
   2(-2) + 3(8) ≟ 20  
   -4 + 24 = 20 ck  
   5(-2) – 2(8) ≟ 31  
   -10 – 16 31 failed  
     
   **(4) (7,2)**2(7) + 3(2) ≟ 20  
   14 + 6 = 20 ck  
   5(7) – 2(2) ≟ 31  
   35 – 4 = 31 ck
8. Which is the solution set to this system of equations?  
   -4x + 2y = 18  
   3x – 6y = -36  
     
   **(1) (-2, 5)**-4(-2) + 2(5) ≟ 18  
   8 + 10 = 18 ck  
   3(-2) – 6(5) ≟ -36  
   -6 -30 = -36 ck
9. The ordered pair (3, -7) is a solution to which system of equations?  
   **(3) 2x – 3y = 27, 4x + 2y = -2**  
   2(3) -3(-7) ≟ 27  
   6 + 21 = 27 ck  
   4(3) + 2(-7) ≟ -2  
   12 – 14 = -2 ck
10. If (a, 5) is a solution to the equation   
    3x + 6y = 42, what is the value of a?  
      
    3(a) + 6(5) = 42  
    3a + 30 = 42  
    -30 = -30  
    3a = 12  
    a = 4  
      
    **(4) 4**
11. Which is not a solution to the system of equations?  
    x + y = 12  
    2x + 2y = 24  
    **(2) (3,10)**  
    3 + 10 12
12. Show how you arrived at your answers.
13. The equation 2x + 3y = 11 has two solutions in which both coordinates are positive integers less than 6. What are those two solutions?  
      
    (1, 3) and (4, 1)  
      
    x = 1  
    2(1) + 3y = 11  
    -2 = -2  
    3y = 9  
    y = 3  
      
    x = 4  
    2(4) + 3y = 11  
    8 + 3y = 11  
    -8 = -8  
    3y = 3  
    y = 1
14. Use guess and check to find the solution to the system of equations.  
    x + y = 8  
    x – y = 6  
    Ordered pairs that satisfy the first equation:  
    (1, 7), (2, 6),(3, 5), (4, 4), (5, 3), (6, 2), (7, 1)  
      
    **(7, 1)**7 + 1 = 8 ck  
    7 – 1 = 6 ck
15. The system of equations:  
    2x + 5y = 25  
    2x + 5y = 26  
      
    has no solutions. Explain why.  
      
    **The two equations are contradictory and any proposed solution to one equation would result in a failed check in the other equation.**
16. The equation x + 3y = c has the point (4,7) in its solution set. What is c?  
      
    4 + 3(7) = 4 + 21 = 25  
    **c = 25**
17. (6, -2) is a solution to the equation   
    5x – 6y = 42.   
      
    Find a solution to 15x – 18y = 126  
      
    5x – 6y = 42  
    Multiply by 3  
    15x -18y = 126  
      
    Therefore (6, -2) is a solution to the second equation as well as the first, since the second equation matches the first equation when multiplied by 3.

## 4.2 Solving Simpler Systems of Equations with Algebra

Certain systems of equations can be solved by combining the two equations such tat one of the variables gets eliminated. Three ways of doing this are addition, when the two equations are added to each other; subtraction, when one equation is subtracted from the other; and substitution, when one of the variables in one equation is replaced by an expression involving the other variable.

### Combining Two Equations to Form a New Equation

2x + 5y = 26  
3x – 2y = 1  
---------------  
5x + 3y = 27

This new equation is satisfied by the ordered pair (3,4).  
5(3) + 3(4) = 27  
15 + 12 = 27  
27 27

### Adding Two Equations to Eliminate a Variable

5x + 2y = 36  
3x – 2y = 12  
---------------  
8x = 48  
x = 6  
5(6) + 2y = 36  
30 + 2y = 36  
-30 = -30  
2y = 6  
y = 3  
  
x = 6, y = 3  
3(6) – 2(3) = 12  
18 – 6 = 12 ck

### Subtracting Two Equations to Eliminate a Variable

4x + 5y = 37  
-(2x + 5y = 31)  
---------------  
2x = 6  
x = 3  
4(3) + 5y = 37  
12 + 5y = 37  
-12 = -12  
5y = 25  
y = 5  
x = 3, y = 5

### Solving Systems of Equations with the Substitution Method

y = 2x + 1  
3x + 2y = 16  
3x + 2(2x + 1) = 16  
3x + 4x + 2 = 16  
7x + 2 = 16  
-2 = -2  
7x = 14  
x = 2  
y = 2(2) + 1  
y = 5  
x = 2, y = 5

### Check Your Understanding of Section 4.2

1. Multiple-Choice
2. Which equation has, as one of it solutions, the solution to the system of equations?  
   **(4) 7x – 3y = 24**
3. Solve the system of equations.  
   3x + 2y = 17  
   4x – 2y = 4  
   -------------  
   7x = 21, x = 3  
   3(3) + 2y = 17  
   9 + 2y = 17  
   -9 = -9  
   ----------  
   2y = 8, y = 4  
   x = 3, y = 4 => (3, 4)  
   **(3) (3,4)**
4. Solve the system of equations.  
   y = 5x + 3  
   2x + 6y = 50  
   2x + 6(5x + 3) = 50  
   2x + 30x + 18 = 50  
   -18 = -18  
   32x = 32  
   x = 1, y = 5(1) + 3 = 8  
   **(1) (1, 8)**
5. Solve the system of equations.  
   6x – 5y = 19  
   -3x + 5y = -7  
   ----------------  
   3x = 12, x = 4  
   6(4) – 5y = 19  
   5y - 19 = 5y - 19  
   ---------------------  
   24 – 19 = 5y, 5y = 5, y = 1  
   x = 4, y = 1   
   **(4) (4, 1)**
6. Solve the system of equations.  
   2x + 3y = -1  
   -2x + 5y = -23  
   ---------------  
   8y = -24, y = -3  
   2x + 3(-3) = -1  
   2x - 9 = -1  
   9 = 9  
   2x = -1 + 9 = 8, x = 4  
   x = 4, y = -3  
   **(3) (4, -3)**
7. Solve the system of equations.  
   -3x + 7y = 1  
   3x + 3y = -21  
   ----------------  
   10y = -20, y = -2  
   -3x + 7(-2) = 1  
   -3x – 14 = 1  
   14 = 14  
   ---------------  
   -3x = 15, x = -5  
   -3(-5) + 7y = 1  
   15 + 7y = 1  
   -15 = -15  
   --------------  
   7y = 1 – 15 = -14, y = -2  
   x = -5, y = -2  
   **(3) (-5, -2)**
8. Solve the system of equations.  
   3x + 7y = -2  
   x – 7y = -10  
   7y = 7y  
   x = 7y – 10  
   3(7y – 10) + 7y = -2  
   21y – 30 + 7y = -2  
   30 = 30  
   28y = 28, y = 1  
   3x + 7(1) = -2  
   -7 = -7  
   3x = -2 – 7 = -9, x = -3  
   x = -3, y = 1  
   **(4) (-3, 1)**
9. Solve the system of equations.  
   5x + 3y = 19  
   -(2x + 3y = 4)  
   -----------------  
   3x = 19 – 4 =15, x = 5  
   5(5) + 3y = 19  
   25 + 3y = 19  
   3y = 19 – 25 = -6, y = -2  
   x = 5, y = -2  
   **(1) (5, -2)**
10. Solve the system of equations.  
    y = 3x – 2  
    4x – 2y = -4  
      
    4x – 2(3x – 2) = -4  
    4x – 6x + 4 = -4  
    -4 = -4  
    -2x = -8, x = 4  
    y = 3x – 2 = 3(4) – 2 = 12 – 2 = 10  
    x = 4, y = 10  
    **(2) (4, 10)**
11. Solve the system of equations.  
    4x + 8y = 36  
    -(4x + 5y = 33)  
    ------------------  
    3y = 3, y = 1  
    4x + 8(1) = 36  
    -8 = -8  
    --------------------  
    4x = 36 – 8 = 28, x = 7  
    4(7) + 8y = 36  
    28 + 8y = 36, 8y = 8, y = 1  
    x = 7, y = 1  
    **(1) (7, 1)**

B. Show how you arrived at your answers.

1. Find an equation that has, as one of its solutions, the solution to the system of equations.  
   3x + 4y = 11  
   2x + 6y = 14  
   ---------------  
   **5x + 10y = 25**x = 1, y = 2  
   (1, 2)
2. A student likes to use the substitution method for systems of equations. How can he use it with a system that is not in the proper form for substitution/ Show with this system.  
   -2x + y = 4  
   3x + 4y = 49  
     
   -2x + y = 4  
   2x = 2x  
   y = 2x + 4  
     
   3x + 4(2x + 4) = 49  
   3x + 8x + 16 = 49  
   -16 = -16  
   11x = 33, x = 3  
   y = 2(3) + 4 = 6 + 4 = 10  
   x = 3, y = 10  
   **Solution: (3, 10)**
3. The system  
   y = 2x – 9  
   y = -3x + 16  
   can be solved in many ways.  
     
   Student 1 wants to use subtraction. Student 2 wants to use substitution. Show how each student would do this.  
     
   **Student 1, subtraction**  
   y = 2x – 9  
   -(y = -3x + 16)  
   -----------------  
   0 = 5x – 25, 5x = 25, x = 5  
   y = 2(5) – 9 = 10 – 9 = 1  
   **x = 5, y = 1**  
     
   **Student 2, substitution**  
   y = 2x – 9  
   y = -3x + 16  
     
   2x – 9 = -3x + 16  
   3x – 16 = 3x – 16  
   --------------------  
   5x – 25 = 0, 5x = 25, x = 5  
   y = 2(5) – 9 = 10 -9 = 1  
   **x = 5, y = 1**
4. Two numbers, x and y, have a sum of 18 but a difference of 11. Write a system of equations that can be used to solve this and then use it to find the solution.  
     
   x + y = 17  
   x – y = 11  
   -----------  
   2x = 17 + 11 = 28, x = 14  
   14 + y = 17  
   -14 = -14  
   y = 3  
   **x = 14, y = 3**
5. The system of equations  
   5x + 2y = 8  
   -5x + 2y = -32  
   can be solved several ways.  
     
   Student 1 wants to use addition. Student 2 wants to use subtraction. Who is right? Explain your answer.  
     
   Both strategies work well. Addition will eliminate the x value and allow solving for y. Subtraction will eliminate the y value allow solving for x.  
   **Student 1, addition**  
   4y = 8 – 32 = -24, y = -6  
   5x + 2(-6) = 8  
   5x – 12 = 8, 5x = 8 + 12 = 20, x = 4  
   x = 4, y = -6  
   **Student 2, subtraction**  
   10x = 8 – (-32) = 40, 10x = 40, x = 4  
   -5(4) + 2y = -32  
   -20 + 2y = -32  
   20 = 20  
   2y = -12, y = 06  
   **x = 4, y = -6**

## 4.3 Solving More Complicated Systems of Equations with Algebra

### Solving a System by Changing One of the Equations

3x + 4y = 31  
5x – 2y = -9

Adding or subtracting the two equations will not eliminate one of the variables.

You are permitted to multiply either equation by whatever number you want.

### Solving a System by Changing Both Equations

Sometimes the only way to change the equations so that a variable will drop out when adding them is to change both equations. This is needed when none of the coefficients is evenly divisible by the corresponding coefficient in the other equation.

### Systems of Equations That Have No Solutions or Infinite Number of Solutions

For some systems of equations, there are no ordered pairs that satisfy both equations. An example of this is:

x + y = 10  
x + y = 11

Any ordered pair that satisfies the first equation will not satisfy the second equation, and any ordered pair that satisfies the second equation will not satisfy the second equation.

The system of equations:

x + y = 10  
2x + 2y = 20

also has something unusual occur.

-2(x + y) = -2(10)  
-2x – 2y = -20  
2x + 2y = 20  
0 = 0

Since 0 does equal 0, the original system has an infinite number of solutions.

### Check Your Understanding of Section 4.3

1. Multiple Choice
2. Solve the system of equations:  
   2x + 3y = 16  
   5y = 10, y = 2  
     
   2x + 3(2) = 16  
   2x + 6 = 16  
   -6 = -6  
   2x = 10, x = 5  
   x = 5, y = 2  
   **(4) 5, 2)**
3. In order to eliminate the **y** from this system of equations,  
     
   3x + 12y = 21  
   6x + 4y = 22  
     
   what could you do?  
   **(2) Multiply both sides of the second equation by -3.**
4. In order to eliminate the x from this system of equations:  
   12x – 3y = 21  
   -2x + 6y = 2  
   what could you do?  
   **(2) Multiply both sides of the second equation by 6.**
5. Which step would not cause a variable to be eliminated after adding equations together in this system?  
     
   3x – 6 = 6  
   9x + 2y = 38  
     
   **(4) Multiply both sides of the first equation by 4.**
6. What is one way to eliminate the y from this system of equations?  
   3x + 4y = 16  
   2x – 5y = 3  
   (3) Multiply both sides of the first equation by +5 and both sides of the second equation by +4.
7. Solve the system of equations:  
   8x – 2y = 28  
   4x + 3y = 6  
     
   -2(4x + 3y) = -2(6)  
   -8x – 6y = -12  
   8x – 2y = 28  
   -8y = 16  
   y = -2  
   4x + 3(-2) = 6  
   4x – 6 = 6  
   6 = 6  
   4x = 6 + 6 = 12  
   x = 3  
   x = 3, y = -2  
   **(4) (3, -2)**
8. Solve the system of equations:  
   4x – 3y = 31  
   3x + 5y = 16  
     
   3(4x – 3y) = 3(31)  
   12x – 9y = 93  
     
   -4(3x + 5y) = -4(16)  
   -12x – 20y = -64  
   12x – 9y = 93  
   -29y = 29  
   y = -1  
   4x – 3(-1) = 31  
   4x + 3 = 31  
   -3 = -3  
   4x = 31-3 = 28  
   x = 7  
   x = 7, y = -1  
   **(1) (7, -1)**
9. Solve the system of equations:  
   x – 3y = 14  
   4x + 5y = 22  
     
   -4(x – 3y) = -4(14)  
   -4x + 12y = -56  
   4x + 5y = 22  
   17y = -34  
   y = -2  
   x – 3(-2) = 14  
   x + 6 = 14  
   x = 8  
   x = 8, y = -2  
   **(4) (8, -2)**
10. Solve the system of equations:  
    3x – 2y = -4  
    5x – 4y = -12  
      
    -2(3x – 2y) = -2(-4)  
    -6x + 4y = 8  
    5x – 4y = -12  
    -x = -4  
    x = 4  
    3(4) – 2y = -4  
    2y + 4 = 2y + 4  
    12 + 4 = 2y  
    2y = 16, y = 8  
    x = 4, y = 8  
    **(1) (4, 8)**
11. What is true about this system of equations?  
    2x – 7y = 2  
    6x – 21y = 7  
      
    3(2x – 7y) = 3(2)  
    6x – 21y = 6  
    6x – 21y = 7 (contradiction)  
    **(4) No ordered pairs solve the system.**
12. Show how you arrived at your answers.
13. For the system:  
    2x + 5y = 17  
    6x + 7y = 27  
    Samuel want to eliminate the y, but Georgia wants to eliminate the x. Which student’s choice will require less work?  
      
    **Eliminating x will require less work, as only the first equation will need to be multiplied by -3. Eliminating y will require more work, with the first equation having to be multiplied by 7, and the second equation by -5.**
14. Solve for x and y in this system:  
    x + y = 40  
    2x + 4y = 136  
      
    -2(x + y) = -2(40)  
    -2x – 2y = -80  
    2x + 4y = 136  
    2y = 56  
    y = 28  
    x + 28 = 40, x = 12  
    **x = 12, y = 28**
15. Aubree solve the system of equations:  
    2x + 3y = 21  
    4x + 6y = 42  
    and get the solution:  
    0 = 0  
    She says this means that every ordered pair is a solution to the system of equations. Is this accurate?  
    Multiplying the first equation by 2 produces the same exact equation as the second equation.  
    2(2x + 3y) = 2(21)  
    4x + 6y = 42  
      
    **It would be more accurate to say there is an infinite number of solutions than any arbitrary ordered pair is a solution to the system of equations.  
      
    The ordered pair (0,0) does not satisfy either equation. But every ordered pair that satisfies the first equation will satisfy the second equation.**
16. If it is possible, find an ordered pair that is a solution to the system.  
    5x – 2y = 5  
    10x -4y = 11  
    Multiplying the first equation by 2:  
    2(5x – 2y) = 2(5)  
    10x – 4y = 10  
    This contradicts the second equation:  
    10x – 4y = 11.  
    **No solution that satisfies the first equation will satisfy the second. There are no solutions.**  
    For example, x =1, y = 0, satisfies the first equation:  
    10(1) – 4(0) = 10  
    10 – 0 = 0  
    10 = 10  
    But x = 1, y = 0 does not satisfy the second equation:  
    10(1) – 4(0) 11  
    10 – 0 11  
    10 11
17. For the system of equations:  
    4x – 3y = 18  
    2x + 12y = 36  
    Victoria starts by multiplying both sides of the second equation by -2. Porter starts by multiplying both sides of the second equation by +2. How is it that either of these methods will lead to the correct solution?  
      
    Victoria can use addition to eliminate x and solve for y. Porter can use subtraction to eliminate x and solve for y. Both approaches will lead to a solution.

## 4.4 Solving Word Problems with Systems of Equations

### Check Your Understanding of Section 4.4

1. Multiple-Choice
2. Which system of equations can be used to model the following scenario? There are 50 animals. Some of the animals have 2 legs and the rest of them have 4 legs. In total there are 172 legs.  
   x is the number of animals with 2 legs  
   y is the number of animals with 4 legs  
   **(4) x + y = 50  
   2x + 4y = 172**
3. Which system of equations could be used to model the following scenario? There are 8 people in n elevator. Soe are adults, and the rest are children. Each adult weighs 150 pounds. Each child weighs 50 pounds. The total weight of the 8 people is 800 pounds.  
   x = number of adults  
   y = number of children  
   **(1) x + y = 8  
   150x + 50 = 800**
4. Which system of equations could be used to model the following scenario? There are 20 coins. Some are quarters, and the rest are dimes. The quarters are worth 25 cents each, and the dimes are worth 10 cents each. The total value of the 20 coins is $2.90.  
   x = the number of quarters  
   y = the number of dimes  
   **(1) x + y = 20  
   25x + 10y = 290**
5. A pet store has 30 animals. Some are cats, and the rest are dogs. The cats cost $50 each. The dogs cost $100 each. If the total cost for all 30 animals is $1,900, how many cats are there?  
   x = the number of cats  
   y = the number of dogs  
   x + y = 30  
   50x + 100y = 1900  
   -50(x + y) = -50(30)  
   -50x – 50y = -1500  
   50x + 100y = 1900  
   50y = 400, y = 8  
   x + 8 = 30, x = 22  
   **(3) 22**
6. A restaurant sells only two desserts, pie and cake. A piece of pie costs $4. A piece of cake costs $5. The restaurant sells 100 desserts, which costs a total of $473. How many pieces of pie did they sell?  
   x = the number of pie pieces sold  
   y = the number of cake pieces sold  
   x + y = 100  
   4x + 5y = 473  
   -4(x + y) = -4(100)  
   -4x – 4y = -400  
   4x + 5y = 473  
   y = 73  
   x + 73 = 100  
   x = 27  
   **(2) 27**
7. A fend is put around a rectangular plot of land. The perimeter of the fence is 28 feet. Two of the opposite sides of the fence cost $10 per foot. The other two sides cost $12 per foot. If the total cost of the fence is 148, what are the dimensions of the fence.  
   x = length of one side of the fence  
   y = length of the other side of fence.  
   2x + 2y = 28  
   10x + 12 y = 148  
   -5(2x + 2y) = -5(28)  
   -10x – 10y = -140  
   10x + 12 y = 148  
   2y = 8, y = 4  
   2x + 2(4) = 28  
   2x = 20, x = 10  
   **(2) 4 by 10**
8. One number is five bigger than another number. When three times the larger number is added to twice the smaller number, the result is 60. What are the two numbers?  
   x – larger number  
   y = smaller number  
   x = y + 5  
   3x + 2y = 60  
   x – y = 5  
   2(x – y) = 2(5)  
   2x – 2y = 10  
   3x + 2y = 60  
   5x = 70  
   x = 14  
   14 = y + 5  
   y = 9  
   **(1) 9 and 14**
9. Peanuts cost $7 a pound. Cashews cost $9 a pound. There is a mixture of peanuts and cashews that weighs 10 pounds and costs $84. How many peanuts are there in the mixture?  
   x = pounds of peanuts  
   y = pounds of cashews  
   x + y = 10  
   7x + 9y = 84  
   -7(x + y) = -7(10)  
   -7x – 7y = -70  
   7x + 9y = 84  
   2y = 14, y = 7  
   x + 7 = 10, x = 3  
   **(3) 3**
10. The current in a river makes boats going upstream slower by y miles per hour and boats going downstream faster by y miles per hour. Upstream boats go 3 miles per hour, and downstream boats go 13 miles per hour. Which system of equations can be used to find the speed of the boat if it were in still sater?  
    x is speed of the boat in still water  
    y is difference in speed going upstream or downstream  
    **(1) x + y = 13  
    x – y = 3**
11. A basketball player made some shots worth two points and the rest worth three points. If she made 16 shots for a total of 38 points, how many of each type did she make?  
    x = number of two point shots  
    y = number of three point shots  
    x + y = 16  
    2x + 3y = 38  
    -2(x + y) = -2(16)  
    -2x – 2y = -32  
    2x + 3y = 38  
    y = 6  
    x + 6 = 16, x = 10  
    (**2) 6 three pointers and 10 two pointers**
12. Show you arrived at your answers.
13. Red roses cost $3 each. Pink roses cost $2 each. A man buys 24 flowers for his wife with some pink roses and the rest red roses. The total cost of the flowers is $68. Write a system of equations to model this situation and use the equation to determine how many red and how many pink roses he bought.  
    x = number of red roses bought  
    y = number of pink roses bought  
    x + y = 24  
    3x + 2y = 68  
    -3(x + y) = -3(24)  
    -3x – 3y = -72  
    3x + 2y = 68  
    -y = -4, y = 4  
    x + 4 = 24, x = 20  
    **20 red roses and 4 pink roses**
14. Ice cream cones cost $4 each. Milkshakes cost $6 each. If ten items are purchased, either ice cream cones or milk shakes: (a) What is the greatest amount of money that can be spent? (b) what is the least amount of money that can be spent? (d) How much would it cost for 5 cones and 5 shakes? (d) if $52 is pent on ten items, how many cones were purchased and how many shakes? Explain how you got your answer to part (d).  
      
    (a) $6 \* 10 = $60.  
    (b) $4 \* 10 = $40  
    (c) (5 \* $4) + (5 \* $6) = $20 + $30 = $50  
    (d)  
    x = number of cones purchased  
    y = number of milkshakes purchased  
    **x + y = 10  
    4x + 6y = 52**  
    -4(x + y) = -4(10)  
    -4x – 4y = -40  
    4x + 6y = 52  
    2y = 12, y = 6  
    x + 6 = 10, x = 4  
    **4 cones purchased, 6 milkshakes purchased.**
15. Marshmallows cost $2 an ounce and have 500 calories in an ounce. Cookies cost $3 an ounce and have 400 calories in an ounce. A mixture of marshmallows and cookies costs $29 and has 4,800 calories. Create a system of equations to model this scenario. How many ounces of marshmallows are there in the mixture?  
    x = ounces of marshmallows  
    y = ounces of cookies  
    **2x + 3y = 29  
    500x + 400y = 4800**-250(2x + 3y) = -250(29)  
    -500x – 750y = -7250  
    500x + 400y = 4800  
    -350y = -2450  
    y = 7  
    2x + 3(7) = 29  
    2x + 21 = 29  
    2x = 8  
    x = 4  
    **4 ounces of marshallows**
16. Three burgers and two orders of French fries cost $24. Five burgers and one order of French fries cost $33. What is the cost of one burger? What is the cost of one order of French fries?  
    x = cost of burger in dollars  
    y = cost of French fries in dollars  
    **3x + 2y = 24  
    5x + y = 33**  
    -2(5x + y) = -2(33)  
    -10x – 2y = -66  
    3x + 2y = 24  
    -7x = -42, **x = 6**  
    3x + 2y = 24  
    3(6) + 2y = 24  
    18 + 2y = 24  
    2y = 6  
    **y = 3**   
    **cost of burger: $6  
    cost of French fries: $3**
17. A cycling store sells two-wheel bicycles and three-wheel tricycles. It sells 58 cycles that had a total of 134 wheels. How many of each type did they sell?  
    x = number of bicycles sold  
    y = number of tricycles sold  
    x + y = 58  
    2x + 3y = 134  
    -2(x + y) = -2(58)  
    -2x – 2y = -116  
    2x + 3y = 134  
    y = 18  
    x + 18 = 58  
    x = 40  
    **Bicycles sold: 40  
    Tricycles sold: 18**