Tone-Up Tuesday #6 Name: _____
Systems of Linear Equations & Inequalities Due Date: 4/14/14 Problems per night: 3

Systems of Linear Equations

A. Solving Systems of Linear Equations by Graphing

STEP 1 Write each equation in a form that is easy to graph.
STEP 2 Graph both equations in the same coordinate plane.
STEP 3 Estimate the coordinates of the point of intersection.
STEP 4 Check the coordinates algebraically by substituting into each equation of the original linear system.

Graph and check to solve the linear system. Remember to label the ordered pair. (#1 is done for you). Put all your work on THIS page.

1. $y = -x + 3$
   $y = x + 1$

2. $15x - 10y = -80$
   $6x + 8y = -80$

GRAPH ON ANSWER SHEET

B. Solving Linear Systems by Substitution

STEP 1 Solve one of the equations for one of its variables.
STEP 2 Substitute the expression from Step 1 into the other equation and solve for the other variable.
STEP 3 Substitute the value from Step 2 into the revised equation from Step 1 and solve.
STEP 4 Check the solution in each of the original equations.

Reminder: Always pick the equation with the variable that will be easier to solve for first. Then substitute it into the other equation to solve. Write the solution as an ordered pair (in alphabetical order!), no solution, or infinite solutions.

Use the substitution to solve the linear system. **Put your ANSWERS on the answer sheet and all your WORK on attached and organized lined paper.**

1. $y = x - 4$
   $4x + y = 26$

2. $2c - d = -2$
   $4c + d = 20$

3. $m + 2n = 1$
   $5m + 3n = -23$

4. $7g + h = -2$
   $g - 2h = 9$

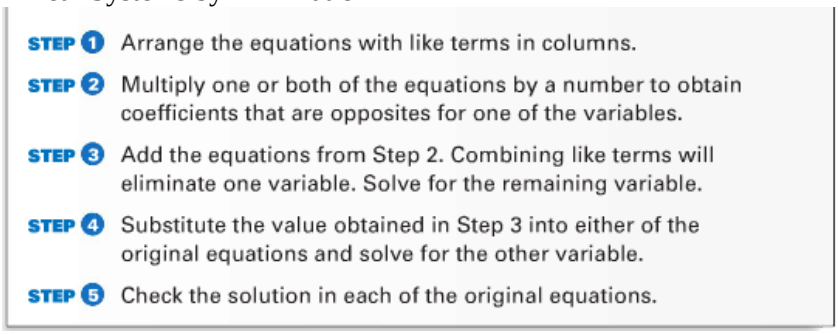
5. $x - 2y = 9$
   $1.5x + 0.5y = 6.5$

6. $5p - 4q = -3$
   $2p - q = -3$

7. $-3x + 2y = -11$
   $5x - y = 23$

8. $m = 7n$
   $3m + 8n = -29$

C. Solving Linear Systems by Elimination



Remember: Look to see which coefficients are going to be the easiest to get to be opposites! Write the solution as an ordered pair (in alphabetical order!), no solution, or infinite solutions.

Use elimination to solve the system of linear equations. **Put your ANSWERS on the answer sheet and all your WORK on attached, organized lined paper.**

1. $2x + y = 4$
   $x - y = 2$

2. $m + 3n = 2$
   $-m + 2n = 3$

3. $x + 3y = 3$
   $x + 6y = 3$

4. $3b + 2c = 46$
   $5c + b = 11$

5. $3p - 2 = q$
   $-q + 2p = 3$

6. $3a + 9b = 8b - a$
   $5a - 10b = 4a - 9b + 5$

7. $1.5v - 6.5w = 3.5$
   $0.5v + 2w = -3$

8. $5y - 20 = -4x$
   $y = -\frac{5}{4}x + 4$

D. Application of Systems of Linear Equations

Hint: Before attempting these problems, it is helpful to remember that you will need **two equations** to correctly solve these systems.

Grading: Identify/describe the variables, write 2 equations, solve the system (on lined paper), write your solution in a sentence.

1. An office supply company sells two types of fax machines. They charge $150 for one of the machines and $225 for the other. If the company sold 22 total fax machines for a total of $3900 last month, write and solve a system of equations to find how many of each type of fax machine were sold?

2. A health food store mixes granola that costs them $4 per pound and raisins that cost them $2 per pound together to make 25 pounds of raisin granola. Write and solve a system of equations to find how many pounds of **raisins** should they include if they want the mixture to cost a total of $80?

3. Francisco purchases *x* hot dogs and *y* hamburgers at a baseball game. He spent a total of $10. The equation below describes the relationship between the number of hot dogs and the number of hamburgers purchased.

$$3x + 4y = 10$$

The ordered pair (2,1) is a solution of the equation. What does the solution (2, 1) represent?

a. Hamburgers cost 2 times as much as hot dogs.
b. Francisco purchased 2 hot dogs and 1 hamburger.
c. Hot dogs cost $2 each and hamburgers cost $1 each.
d. Francisco spent $2 on hot dogs and $1 on hamburgers.

4. Anna burned 15 calories per minute running for *x* minutes and 10 calories per minute hiking for *y* minutes. She spent a total of 60 minutes running and hiking and burned 700 calories. The system of equations shown below can be used to determine how much time Anna spent on each exercise.

$$15x + 10y = 700$$
$$x + y = 60$$

What is the value of *x*, the minutes Anna spent running?

a. 10 c. 30
b. 20 d. 40

5. Samantha and Marie purchased flowers. Samantha purchased 5 roses for *x* dollars each and 4 daisies for *y* dollars each. She spent $32 on the flowers. Marie purchased 1 rose for *x* dollars and 6 daisies for *y* dollars each. Marie spent a total of $22. The system of equations shown below represents this situation.

$$5x + 4y = 32$$
$$x + 6y = 22$$

Which statement is true?

a. A rose costs $1 more than a daisy.
b. Samantha spent $4 on each daisy.
c. Samantha spent more on daisies than she did on roses.
d. Samantha spent over 4 times as much on daisies as she did on roses.

6. A baseball team had $1,000 to spend on supplies. The team spent $185 on a new bat. New baseballs cost $4 each. The inequality $185 + 4b \leq 1000$ can be used to determine the number of new baseball (*b*) that the team can purchase. Which statement about the number of new baseballs that can be purchased is true?

a. The team can purchase 204 new baseballs.
b. The minimum number of new baseballs that can be purchased is 185.
c. The maximum number of new baseballs that can be purchased is 185.
d. The team can purchase 185 new baseballs, but this number is neither the maximum nor the minimum.

7. Tyreke always leaves a tip of between 8% and 20% for the server when he pays for his dinner. This can be represented by the system of inequalities shown below, where *y* is the amount of tip and *x* is the cost of dinner.

$$y > 0.08x$$
$$y < 0.2x$$

Which of the following is a true statement?

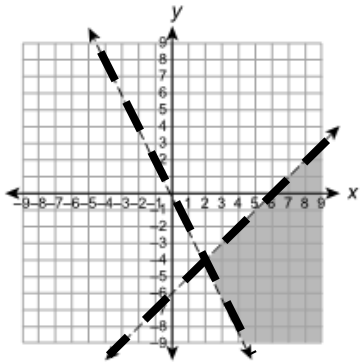
A. When the cost of dinner (*x*) is $10, the amount of tip (*y*) must be between $2 and $8.
B. When the cost of dinner (*x*) is $15, the amount of tip (*y*) must be between $1.20 and $3.00.
C. When the amount of tip (*y*) is $3, the cost of dinner (*x*) must be between $11 and $23.
D. When the amount of tip (*y*) is $2.40, the cost of dinner (*x*) must be between $3 and $6.

8.

A system of inequalities is shown: $y < x - 6$, $y > -2x$

Which graph shows the solution set of the system of inequalities?

A.



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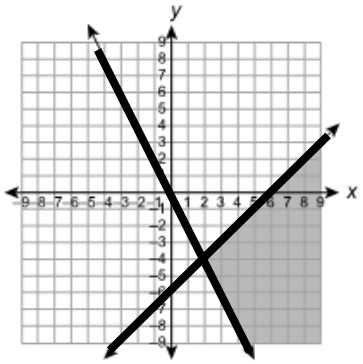

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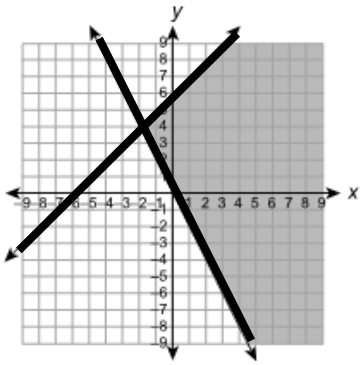
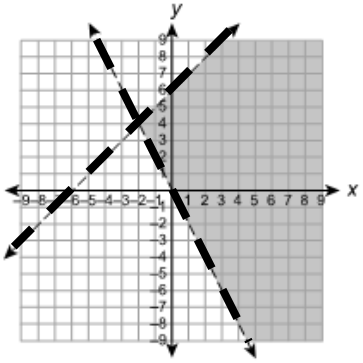


D.



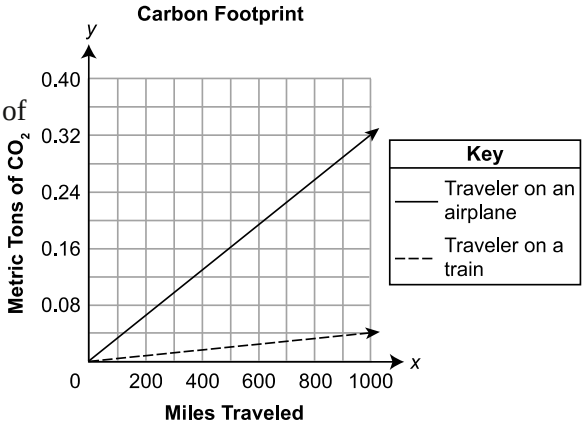
9. Ahava is traveling on a train.

A. The train is going at a constant speed of 80 miles per hour. How many hours will it take for the train to travel 1,120 miles?

B. Ahava also considered taking an airplane. The airplane can travel the same 1,120 miles in 12 hours less time than the train. What is the speed of the airplane in miles per hour (mph)?

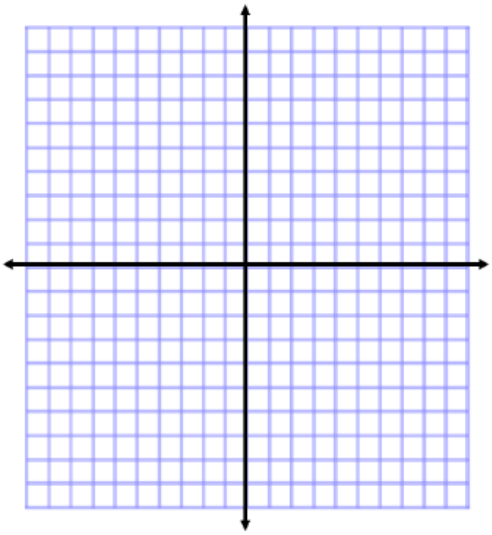
C. Ahava is very concerned about the environment. The graph below displays the carbon dioxide (CO2), in metric tons, for each traveler on an airplane and each traveler on a train.

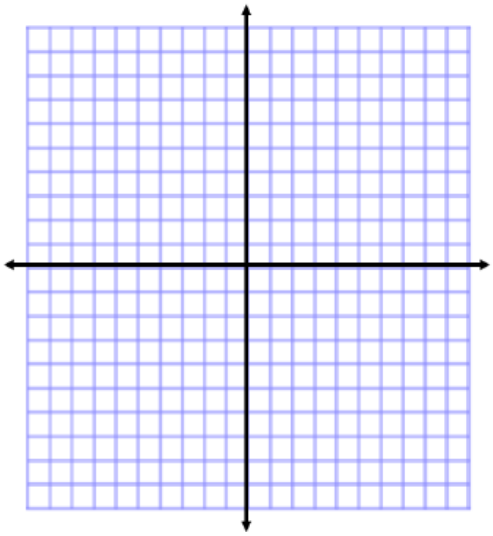
What is the equation to find the metric tons of CO2 produced (y) by a traveler on an airplane for miles traveled (x)?



Name: _____ TUT #6 ANSWER SHEET

A.

1. 

2. 

B. Work on Lined Paper	
1.	5.
2.	6.
3.	7.
4.	8.

C. Work on Lined Paper	
1.	5.
2.	6.
3.	7.
4.	8.

D.

1.

Variables:	Equations:	Work:	Solution:
		On Attached and Organized Lined Paper	

2.

Variables:	Equations:	Work:	Solution:
		On Attached and Organized Lined Paper	

3. A B C D	6. A B C D
5. A B C D	7. A B C D
6. A B C D	8. A B C D

9. WORK ON LINED PAPER

A. Hours = _____

B. Speed of airplane = _____ mph

C. Equation: _____