Name:_____ Date:_____
Systems of Equations: Looking at Energy Costs Handout Period:_____

As we learned earlier this year, replacing the light bulbs in your house from incandescent to compact fluorescent light bulbs (CFL) can help to lower your carbon footprint and your impact on the environment. But how expensive will it be to make the switch?

Example #1
Suppose Jessica wants to find out how much incandescent light bulbs cost over time in comparison to CFL's.

Light bulb Type	**Price per light bulb (in cents)**	**Electricity Cost per day (in cents)**
Incandescent Light Bulb (60 watts)	50	30
Compact Florescent Bulb (18 watts-60 watt equivalent)	590	10

a.) Write an equation to represent the total cost for each light bulb. Let *y* equal the total cost and let *x* equal the number of days. [Hint: Total Cost = price per light bulb + (cost per day) × (the number of days)]

Incandescent Light Bulb Equation:

Compact Florescent Light Bulb Equation:

b.) What is the slope and *y*-intercept of each equation? What do they represent in the situation?

Incandescent Light Bulb:

The slope, _____ represents _____.

The *y*-intercept, _____ represents _____.

Compact Florescent Light Bulb:

The slope, _____ represents _____.

The *y*-intercept, _____ represents _____.

c.) Graph both equations on the same coordinate plane on a separate sheet of graph paper.

d.) What are the coordinates of the point where the two lines intersect? What does that point represent?

The point where the two lines intersect is _____ and represents _____

_____.

The two equations in the previous example together are called a **system of equations**. The **solution** of the system is the ordered pair that makes both equations true. One method for solving a system is to graph the equations on the same coordinate plane. The coordinates of the point where the graphs intersect is the solution of the system of equations.

e.) Substitute your ordered pair in for *x* and *y* in each equation to verify that your solution makes both equations true.

Sometimes using graphing to solve a system of equations is not the most accurate method and requires estimation. A more accurate method for solving a system is using **substitution**.

f.) Follow the substitution method used in your textbook Glencoe Pre-Algebra on page 416 to solve the system of equations. (We will complete this together as a class.)

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Systems of Equations: Looking at Energy Costs Homework Section:_____

Practice and Apply:

1. Jacob wants to buy a computer and would like to compare the costs over time of purchasing a desktop computer and monitor versus a laptop. Using the table below, write two equations that represent the cost of each computer. Let *y* equal the total cost and *x* equal the number of days. Graph both equations on one coordinate plane. Find the solution. What does the solution represent in terms of the situation?

Computer Type	**Purchase Price ($)**	**Electricity Costs per day ($)**
Desktop computer with 17" LCD monitor	$800	$0.60
Laptop computer	$950	$0.20

2. Use the substitution method to solve the same system.

Analysis/Reflection Questions:

3. Compare and contrast the two methods of solving systems of equations. Discuss the good and bad aspects of each.

4. What additional factors are not being addressed in these two examples that would be factors to consider in a real life situation?

5. How might these factors change the overall costs over time?

6. Could these factors have an affect on purchasing choices?

7. How might more energy-efficient products play a part in lowering your ecological footprint? What actions could you take now or in the future to make this happen?