NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Car Comparison Project**



***Introduction***

Systems of linear equations are a useful way to solve common problems in different areas of life. One of the most powerful ways to use them is in a comparison model where two similar situations are compared side by side to determine which one is better. In this project, you will be choosing two cars that you are interested in purchasing and then using systems of linear equations to decide which one is the better buy for you.

***Car Comparison***

Situation: Your job requires you to be on the road a lot and therefore your company will buy you a vehicle that you will use for 6 years. However in order to buy the vehicle you need to demonstrate to your company that you have researched your options and are purchasing the most economical vehicle you can. You are trying to decide between getting a hybrid or a regular sedan. The hybrids cost more upfront, but get better gas mileage, so will cost less to drive. Regular cars cost less upfront, but get worse gas mileage, so they will cost more to drive.

For this project you will need to choose one hybrid and one regular midsized sedan

from the lists below. Please circle one car from each list.

**Hybrids**

Toyota Prius

Chevy Volt

Honda Civic Hybrid

Toyota Camry Hybrid

Ford Fusion

**Regular Sedans**

Ford Focus

Honda Accord

Chevy Malibu

Chrysler 200 Limited

Ford Taurus

Assignment: You will gather information (price and monthly gas cost) for each of the cars you choose. Then you will write a system of linear equations for the two cars and create a graph to determine which car will be the better buy for you. (Keeping in mind that you will be driving the car for 6 years.) You will be completing and turning in this packet as well as a power point as your final products for the project.

***Project Steps...***

Step 1 – Research your cars online.

|  |  |  |
| --- | --- | --- |
|  | **Hybrid:**  | **Regular Sedan:** |
| **Cost ($)** |  |  |
| **Gas Mileage (miles/gallon)** |  |  |

Step 2 – Calculate what your monthly gas costs would be for each car. In order to do this, please assume the following…

* *Gas costs $3.50 per gallon.*
* *You will be driving 1000 miles each month.*

(Hint: First, figure out how many gallons of gas will you need to buy each month for each car.)

|  |  |  |
| --- | --- | --- |
|  | **Hybrid:**  | **Regular Sedan:** |
| **Monthly Gas Costs** | Work: | Work: |
| Answer: | Answer: |

Step 3: Write the linear equation for each car, letting x represent the number of months that you have driven the car and y represent the total costs of the car to that point.

|  |  |  |
| --- | --- | --- |
|  | **Hybrid:**  | **Regular Sedan:** |
| **Equation** |  |  |

Step 4: Solve the system of linear equations both graphically and algebraically.

**Solve By Graphing:** My solution is ( ).

Label: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Label: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Solve by Substitution:**

 Equations: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 My solution is ( ).

**Solve by Elimination:**

Equations: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 My solution is ( ).

Step 5: Interpret the meaning of your solution as it relates the new car scenario.

Step 6: You need to create a power point for your company showing them the comparison between the two cars, and explaining which car will be the better buy.

 Your power point should include the following…

1. A title page, including both partners names as well as the hour you are in.
2. A table illustrating the comparison of the hybrid and the regular car that includes…
	* Price of each car
	* Gas mileage of each car
	* Total monthly gas costs of each car
	* Equation for each car
3. Graph showing the cost comparison between the hybrid and the regular car. See your teacher for further directions on this part.
4. A statement explaining the meaning of the solution of the system.
5. A final statement explaining which car is the better buy for and why. (Keep in mind you will be keeping the car for 6 years)

Step 7: Share your powerpoint with your teacher via google docs.

Step 8: Turn in your project packet and rubric.

|  |  |
| --- | --- |
| **Car Comparison Project – Grading Criteria** | Score |
| **Research** | * + Car research complete. \_\_\_\_\_/4
 | \_\_\_\_4 |
| **Handwritten Work** | * + Monthly Gas Costs Calculated. \_\_\_\_\_/4
	+ Total Cost Equations are written. \_\_\_\_\_/4
	+ System Solved By Graphing (estimation only)

-Axis Labeled \_\_\_\_\_/1-Axis correctly scaled. \_\_\_\_\_/1-Lines correctly Graphed \_\_\_\_\_/2-Solution Accurately Estimated \_\_\_\_\_/1 * + System Solved By Substitution. \_\_\_\_\_/5
	+ System Solved By Elimination. \_\_\_\_\_/5
	+ Solution Interpreted Correctly \_\_\_\_\_/2
 | \_\_\_\_25 |
| **Powerpoint** | * Title Page \_\_\_\_\_/2
* Table \_\_\_\_\_/4

\_\_\_Price\_\_\_Gas Mileage\_\_\_Total Monthly Costs\_\_\_Equations* Graph \_\_\_\_/8

\_\_\_Title\_\_\_Axis are labeled\_\_\_Legend Correctly Labeled\_\_\_Accurate* Solution Interpreted \_\_\_\_/2
* Argument \_\_\_\_/2

-Sound argument-Complete Sentences* Professional Appearance \_\_\_\_/3

\_\_\_organized\_\_\_appears professional\_\_\_Grammar, punctuation, spelling | \_\_\_\_\_21 |

 Total = \_\_\_\_\_\_\_/50