**Exponential Functions Project**

You are going to buy a car that will need to be financed. You will need to look at different options and decide which one will be the best choice for your situation. You will need to find a car on the internet that you want to purchase.

Pick **two cars** of your choice in order to compare the best option in the end. You can look at any internet site, but you might consider: [http://www.edmunds.com](http://www.edmunds.com/) to learn how the advertised prices compare with market prices generally for cars of the same make, model and year.

Car#1 Make Model Price

Car#2 Make Model Price

You are to answer the following questions:

1. What does it mean to be **upside down in a loan**? Look it up, then write the definition in your own words.
2. Find the price of two new 2019 vehicles that you would be interested in buying. Research the rate of depreciation for the models you are interested in and use the following table to figure out the value of each car over 10 years. A good side to find the depreciation is

<https://goodcalculators.com/car-depreciation-calculator/>

|  |  |  |
| --- | --- | --- |
| **Year** | **Cost car 1** | **Cost car 2** |
| **0** |  |  |
| **1** |  |  |
| **2** |  |  |
| **3** |  |  |
| **4** |  |  |
| **5** |  |  |
| **6** |  |  |
| **7** |  |  |
| **8** |  |  |
| **9** |  |  |
| **10** |  |  |

1. Graph the models for the **depreciation of each car in BLUE**. Make sure that you connect the dots in a curve pattern.

**Graph of cost depreciation for the car 1:**



**Graph of cost depreciation for the car 2:**



1. Go to the following website and download the amortization sheet:

<http://www.calculator.net/amortization-calculator.html>

Use 5.25% as the APR. Calculate the total loan payments that you would have to make for 3,4,5,7 and 10 years:

|  |  |  |
| --- | --- | --- |
| Number of loan years | Total payments for car 1 | Total payments for car 2 |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 7 |  |  |
|  10 |  |  |

Compare these results. Why some are higher than others for the same car?

1. Write the total amount of the interest that you have to pay for each of the 5 situations described in step 4:

|  |  |  |
| --- | --- | --- |
| Number of loan years | Total interest paid for car 1 | Total interest paid for car 2 |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 7 |  |  |
|  10 |  |  |

1. Assuming that you will take a 10-year long loan on your car, complete the following table with the amount of principal left after each year (look at the balance value):

|  |  |  |
| --- | --- | --- |
| **Year** | **Principal left (balance) for car 1** | **Principal left (balance) for car 2** |
| **0** |  |  |
| **1** |  |  |
| **2** |  |  |
| **3** |  |  |
| **4** |  |  |
| **5** |  |  |
| **6** |  |  |
| **7** |  |  |
| **8** |  |  |
| **9** |  |  |
| **10** |  |  |

1. On the same graphs from Question 2, graph the Principal left to pay from Question 6 for both cars in RED. Connect the dots in a curve pattern.

In what years is the RED line above the BLUE line for car 1?

In what years is the RED line above the BLUE line for car 2?

1. What does it mean when the RED line is above the BLUE line?
2. Based on these two graphs, which car do you think that is the best option to purchase?

Explain why. Please write your answer as a short paragraph.