Personal Finance Project ***Name***: _____

Formulas:

$$P_0 = \frac{d\cdot\left(1-\left(1+\frac{r}{k}\right)^{(-k\cdot t)}\right)}{\left(\frac{r}{k}\right)} \qquad d = \frac{P_o\left(\frac{r}{k}\right)}{\left(1-\left(1+\frac{r}{k}\right)^{(-k\cdot t)}\right)}$$

$$< Total\ Amount\ (Including\ Interest\ Amount) >= d \cdot k \cdot t$$

$$< Total\ Interest\ Amount >=< Total\ Amount > -P_0$$

1. A credit card holder has $8,000 on a credit card that charges nominal rate of interest (compounded 12 times a year. If the card holder wants to pay off the credit card in 5 years, how much will the card holder need to pay (assuming that the card holder does not charge anything new to the card)?

a) If the card holder is a low-risk customer, and the credit card company will charge 14% annual rate of interest (compounded 12 times a year). Compute:

i. **[5 points]** Monthly payment:

Directions:

- Use one of the given formulas to show formula and your work.
- Copy and paste formula and enter given values into the formula.
- For example, use a desmos.com calculator to compute monthly payment.
- Type the result of your computations.

<Enter the formula, work, and answer here!>

ii. **[5 points]** Compute the total amount of money the card holder will pay:

<Enter the formula, work, and answer here!>

iii. **[5 points]** Total interest amount the credit card company will earn:

<Enter the formula, work, and answer here!>

b) If the card holder is a higher-risk customer, and the credit card compony will charge 24.5% annual nominal rate of interest (compounded 12 times a year). Compute:

i. **[5 points]** Monthly payment:

<Enter the formula, work, and answer here!>

ii. **[5 points]** Total amount of money the card holder will pay:

<Enter the formula, work, and answer here!>

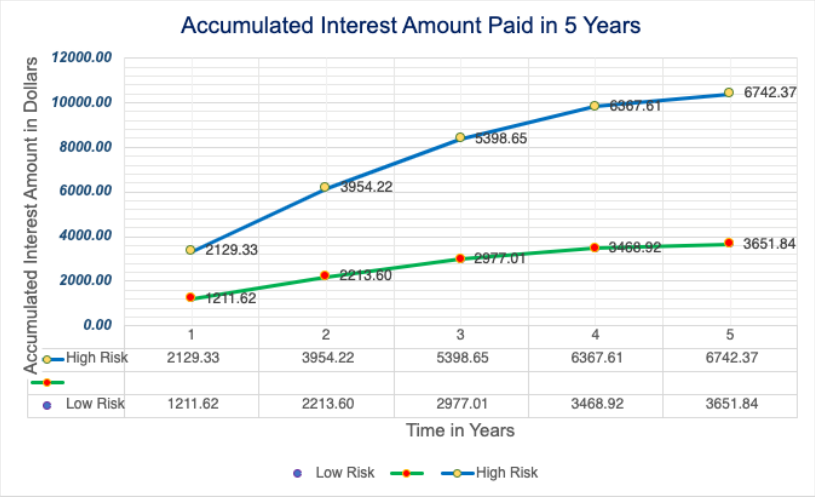
iii. **[5 points]** Total interest amount the credit card company will earn:

<Enter the formula, work, and answer here!>

2. Use attached Microsoft Excel Dashboard in the link provided in the directions to the project.

- Open and download the Dashboard.
- On the Dashboard in the Grey Box enter given values: $P_0 = 8000, k = 12, r = 0.14, and\ R = 0.245$
- Observe changes in monthly payments, values in tables, and graphs.
- Copy the graph from the Dashboard and replace the example graph provided bellow.

a) **[5 points]** Display graphs and table here (Bellow you can see the Microsoft Excel graphs' example for case: loan amount is \$10,000, low-risk interest rate $r = 13\%$ and higher-risk interest rate is $r = 22.4\%$, time to payout loan is 5 years). Replace the Example of the graph bellow:



b) **[5 points]** Using graphs calculate the difference in the interest amount of money earned in 5 years by the credit company charging 24.5 % versus 14% interest rate.

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c) **[10 points]** Keep all given values the same and only decrease the interest rate $r = 8\%\ and\ R = 20\%$ (Use Dashboard), state your observations

- Monthly Payment: low risk _____ high risk _____
- Accumulated Interest Amount: low risk _____ high risk _____
- Total Loan Amount: low risk _____ high risk _____
- Are these values increased or decreased in comparison to a given problem conditions: _____

d) **[10 points]** Keep all given values the same you only decreased the number of payments to $k = 4$ (Use Dashboard), state the following values:

- Monthly Payment: low risk _____ high risk _____
- Accumulated Interest Amount: low risk _____ high risk _____
- Total Loan Amount: low risk_____ high risk_____
- Are these values increased or decreased comparison to a given problem conditions: _____

3. Use the Extra Payments spreadsheet to observe how extra payments can reduce the interest amount.

(a) **[10 points]** Every month you make additional payment of 50 dollars, determine:

- Accumulated Interest Amount: low risk _____ high risk _____
- Total Loan Amount: low risk_____ high risk_____
- Total Interest Amount Saved: low risk_____ high risk_____

(b) **[10 points]** Every April you are receiving 1200 dollars return on income tax, and you can apply this amount as extra payment on the credit card loan:

- Accumulated Interest Amount: low risk _____ high risk _____
- Total Loan Amount: low risk_____ high risk_____
- Total Interest Amount Saved: low risk_____ high risk_____

4. **[20 points]** In 3-4 sentences state your conclusion: (You can state your observations, and also discuss options to reduce the person losses).